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Table of Contents

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ORIGINAL ARTICLES— PAGE.

"Abnormal Hyperplasia of the Female Breast and its Relation to Tumour Formation," by ALFRED J. TRINCA, M.D., F.R.C.S., F.C.S.A. .. 732

"The Conservation of Function in Gynæcology," by VICTOR BONNEY, M.D., M.S., F.R.C.S., M.R.C.P., D.Sc. .. 741

"Some Notes on the Treatment of Otitis Media and Acute Mastoiditis in Children," by LESLIE J. MIDDLETON, M.B., B.S., F.R.C.S. .. 744

"Comparative Statistics in Regard to Maternal Mortality," by E. SYDNEY MORRIS, M.D., Ch.M., D.P.H. .. 747

REVIEWS—

Treatment in Pædiatrics .. 749
Neurological Examination .. 750
A Handbook on Oto-Rhino-Laryngology .. 750

LEADING ARTICLES—

Physicians and Surgeons .. 751

CURRENT COMMENT—

The Monocytes in Pneumonia .. 752

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—

Bacteriology and Immunology .. 754
Hygiene .. 755

BRITISH MEDICAL ASSOCIATION NEWS— PAGE.

Scientific .. 758
Nominations and Elections .. 760

CORRESPONDENCE—

The Venereal Diseases Problem .. 760

POST-GRADUATE WORK—

Post-graduate Work in Melbourne .. 761

CONGRESSES—

Conference of the International Union Against Tuberculosis .. 761

OBITUARY—

Egbert John Connell .. 762
John Daniel King Scott .. 762
Percy Samuel Webster .. 762

DIARY FOR THE MONTH .. 762

MEDICAL APPOINTMENTS VACANT, ETC. .. 762

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 762

EDITORIAL NOTICES .. 762

ABNORMAL HYPERPLASIA OF THE FEMALE BREAST AND ITS RELATION TO TUMOUR FORMATION.[1]

By ALFRED J. TRINCA, M.D., F.R.C.S., F.C.S.A.,
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No one can be satisfied with the present position in regard to cancer of the female breast. A study of the literature of the past ten years on the subject shows that there has been no decrease in the mortality from this scourge, but rather an increase. We can hardly hope for improvement by the introduction of new methods of operative technique, for since Sampson Handley pointed out the means of attack on the established disease, most of the attempts to cope with the problem have been along the lines of introducing minor modifications of his original operation and such measures as diathermy, the hot knife and the like. These show that the profession has to some extent misdirected its energies in attempting to cope with the later stages of cancer and has not realized its real responsibilities and obligations.

The road to improvement lies in other directions.

Apart from the obvious need for propaganda to induce women to report earlier to their medical advisers, it is essential to impress upon the practitioner the necessity for earlier diagnosis of cancer and to establish firmly in his mind a knowledge of the nature of those conditions which histological evidence suggests are likely to lead to cancer. Further, he must appreciate that the distinction between innocent and malignant tumours is not a hard and fast one and that tumours may be only a local expression of a more widespread and perhaps general change in the breast tissues.

Failure to realize these facts in 1921 was responsible for a tragic incident in the case of a patient with whom I was concerned, and originated the investigation which has led to the presentation of this paper.

The facts were as follow:

In May, 1921, a married woman, J.M., *ætatis* thirty-three years, presented herself for examination in the Out-Patient Department of the Alfred Hospital, complaining of a "lump" in the breast. An examination revealed that she had all the classical features of an adenoma, a tumour the size of a walnut being found in the lower outer quadrant of the breast so freely movable that it escaped easily on manipulation from the examining fingers into the rest of the breast tissue.

The tumour was enucleated in the usual way and sent for microscopical examination. The removal was clean except for an adherent piece of breast tissue at one point. Following the usual custom I sectioned a small piece of the tumour and forwarded to the surgeon concerned a report "typical fibro-adenoma."

Seven weeks later the same woman returned to the clinic, complaining of a lump in the scar of the recent operation. To our astonishment examination revealed a tumour in the scar adherent to the skin and underlying tissues and having the characteristics of a carcinoma. A radical operation was performed and the breast and axillary glands forwarded for microscopical examination. The microscopical examination revealed scirrhous carcinoma both in the scar nodule and in the axillary glands. Six months later the patient was dead as the result of rapid and extensive dissemination in the bones and viscera.

This case taught a most important lesson and led to an investigation of the potential dangers of apparently innocent breast lesions. My first impression was that I had made a serious error in diagnosis by designating a carcinoma an innocent tumour and obviously my first duty was to reexamine the section on which the original diagnosis had been made and to examine further sections from the specimen which had fortunately been kept. The piece of adherent and apparently normal breast tissue was next sectioned and showed the early development of carcinoma and certain departures from the normal structure similar to some of those that will be shown tonight and which for want of a better term are designated by the non-committal phrase, "abnormal hyperplasia." I may add that there was no evidence of carcinoma in the original and other sections cut from the adenoma. (See Figures XLI, XLII, XLIII.)

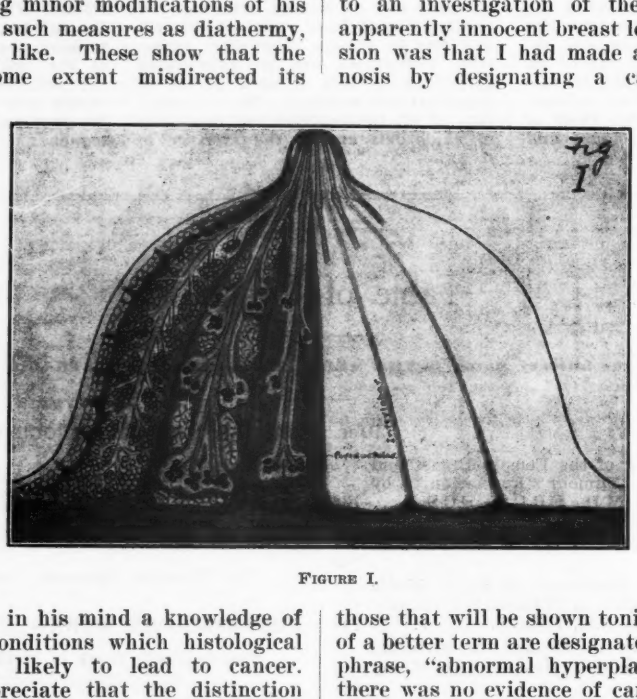

FIGURE I.

The inferences to be drawn from the investigation of the case of Mrs. J. M. were that either abnormal hyperplastic breast tissue in the bed of an adenoma had been stirred into cancerous activity by the surgical removal of the tumour or that in the bed there coexisted a definite carcinoma, unrecognizable by ordinary clinical signs, which had been subjected to the same process of activation.

The slides to be shown tonight are from sections of cases of breast thickenings which had none of the textbook clinical signs of cancer and from the mammary tissue in breasts the subjects of innocent and malignant tumours. They are selected from a large number of cases collected over a period of seven years and illustrate the histological pictures

[1] Read at a meeting of the Victorian Branch of the British Medical Association on April 13, 1928.

which it is my purpose to prove have a definite relationship to the development of actual tumours in the breast.

The Normal Breast.

To begin with I would claim your attention to a brief account of the structure, development, evolution and involution of the breast.

Figure I is a diagrammatic representation of the structure of the breast during various phases of its activity and shows the virginal, lactating and quiescent states.

The breast tissue consists of stroma and parenchyma, but the former constitutes by far the greater bulk of the tissue in the virginal and quiescent breast and is more responsible for the size and consistency of the non-lactating organ than the glandular elements.

The juvenile breast is firm, elastic and soft; the senile soft and inelastic. The firmness and elasticity of the former are due to the fibrillar character of the stroma and the softness to the mucinoid change that apparently takes place in the stroma. Exceptions, of course, arise in the obese, but even in these the fat is laid down mainly outside the capsule of the breast.

The characteristics of the senile breast are due to its adipose tissue.

Structure of the Stroma.

The stroma is mainly derived from the underlying deep fascia and can be classified according to its relation to the parenchyma as follows:[1]

1. *Interlobar Connective Tissue.*—Interlobar connective tissue extends from the deep fascia towards the skin, dividing the breast into about twenty lobes. Each lobe represents a duct system, but cannot be separated from adjacent lobes by linear subdivision.

2. *Interlobular Connective Tissue.*—The interlobular connective tissue is a fine fibrillar tissue which separates the lobules.

3. *Perilobular Connective Tissue.*—Perilobular connective tissue is a similar fine fibrillar tissue concentrically arranged around each lobule and inseparable from the interlobular connective tissue.

4. *Periductular Connective Tissue.*—Periductular connective tissue is a different type of fibrous tissue, more embryonic in nature and very intimately associated with the individual elements of the parenchyma isolating them as it were from the rest of the stroma. In the early months of pregnancy this tissue undergoes a considerable hypertrophy, becomes softer and looser and apparently mucoid in character. Into this the budding parenchyma advances and reaches its final evolution, causing in its advance an apparent complete disappearance of the periductular connective tissue. Cheatle[2] by special staining method has shown the detailed structure of the stroma immediately surrounding the walls of the ducts and acini and its relation to fibro-adenomata and other pathological conditions.

5. *Adipose Tissue.*—In addition to the aforementioned supporting tissues there is a varying amount of adipose tissue, the amount varying with the state of nutrition or obesity of the individual. But it must be borne in mind that in the young virgin breast there is very little fat and that it is mainly in the neighbourhood of the interlobar tissue. With the advance of years there is an encroachment of fat on the other connective tissues and a closer association developes with the parenchymal elements. The only difference between the structure of the young and aged virginal breasts is in the amount and disposition of the fat.

The Parenchyma.

The parenchyma developes from the ducts beneath the areola and spreads by radial extensions as long tubular duct-like structures that branch progressively as they reach the deeper and remote confines of the breast. In the virginal breast the amount of parenchyma is exceedingly small and consists of simple ducts and small aggregations of ducts forming rudimentary lobules.

Evolution.

In the evolution of the lactating breast glandular tissue grows by a process of budding from the ducts and alveoli. The buds are later channelled into acini with the ultimate establishment of fully developed lobules. Meanwhile the connective tissues of the breast atrophy in the path of the advancing parenchyma. Secretion begins as soon as lumina are formed in the new acini, but the process is not uniform as it occurs earliest in the first formed acini. A microscopical examination of the breast at term before suckling begins shows acini in various stages of development and filling with secretion. Full secretion does not begin until twenty-four hours after childbirth and it is probable that the parenchyma continues to develope to meet the needs of the growing child.

Involution.

In the event of interruption of pregnancy at any stage or of any factor that prevents nursing, a structural retrogression immediately takes place. The water in the acinar contents is removed by a process of absorption, leaving behind molecular fat in greater or less amounts in the ducts, whilst the empty acini collapse and disintegrate. Elastic tissue still remaining contracts, with a resultant condensation of lobules or portions of lobules from the structureless mass. Into this the periductular connective tissue proliferates, whilst most of the acini disappear leaving ductules supported by periductular connective tissue and ending in lobules. This lobular structure persists for a considerable time, but in the event of no further pregnancy the lobules atrophy until a stage is reached closely resembling the virgin breast with its vestigial lobules.

The lobule, therefore, is a temporary structure which normally developes only to fulfil a specific function.

In many women the process of involution is not uniform and retention of secretion delays and

modifies the process. The result is the formation of residual lactation acini (Figure VIII) which are often found in the breast years after the commencement of involution. In the residual lactation acini the effects of retention of secretion are liable to become manifest in the shape of dilatation of acini possibly aggravated by chemical changes in the retained secretion and ultimately the formation of cysts of various sizes.

Such changes, however, are not confined to the breast which undergoes involution after pregnancy. Identical histological appearances are seen in the breasts of *nulliparæ*, although more rarely and can be explained on the basis of the changes resembling those of evolution that take place in the virgin gland during menstruation and as the result of other forms of stimulation. In response to stimuli of various kinds the non-lactating gland is continually secreting and secretion must normally be balanced by absorption, for there is no outlet through the nipple ducts as in the nursing mother. Disturbance of this balance is no doubt a potent cause of the retention changes that occur in the virginal and resting breast, changes that are indistinguishable histologically from those found in the abnormally involuting gland.

The usual time for the completion of involution is between one and two years, but areas of unchanged lactation tissue may persist for many years. MacFarland[3] has observed them as long as fifteen years after the last pregnancy.

Figure II is from a section of the breast of a virgin, *ætatis* twenty-five years, and shows the typical structure of the virginal breast. Note the fine fibrillar character of the stroma and the scarcity of fat and parenchyma. The latter is represented only by a small group of ductules without the development of lobules. The periductular connective tissue is small in amount but can be identified.

Figure III is from a section of the breast of a multiparous woman, aged fifty-seven, whose last child was born twenty years before. Note the same fibrillar stroma as in Figure II and the scanty parenchyma. Fat, however, is much more in evidence and in more intimate relationship with the parenchyma. A small rudimentary lobule with a few isolated ducts are the only evidences of glandular structure. It is almost impossible to identify the periductular connective tissue.

Figure IV is from a breast removed at autopsy from a woman, three months pregnant. Note the disappearing fibrous stroma, the well marked periductular connective tissue and the well defined lobulation. The cell details have been somewhat obscured by autolysis.

Figure V shows a breast in the seventh month of pregnancy. Two ducts containing secretion and several groups of lobules are seen. The stroma is disappearing and is much less evident than in Figure IV.

Figure VI is from another portion of breast from the same patient and illustrates the lack of uniformity in the process of evolution, the acini varying in size and development.

Figure VII shows the fully developed lactating breast of a woman who died five days after the birth of a stillborn child and is photographed from a frozen section of unfixed tissue. Note the almost complete disappearance of stroma and the early stages of involution in the destruction of alveolar walls and the confusion of structure.

Figure VIII shows a residual lactation lobule and groups of residual lactation acini in the breast of a woman six months after the birth of her child which was artificially fed. Surrounding the lobule are small groups of residual lactation acini and other lobules in various stages of involution. Note the return of the fibrillar stroma and the absence of periductular connective tissue and the excessive lobulation.

Abnormal Metaplasia.

I will now show microphotographs of a series illustrating abnormal hyperplasia.

Figure IX is from a childless woman, *ætatis* fifty years, who complained of a thickening in her left breast with intractable pain. It illustrates changes in a non-pregnant woman resembling those of evolution. Note the lobulation and development of the periductular connective tissue and its close resemblance to the three months' pregnant breast (Figure IV).

The next series of four sections are all taken from different portions of the one breast in a woman, *ætatis* forty-three, who gave a history of generalized thickening in the right breast, noticed for nearly a year and of bleeding from the nipple for a few months. They illustrate the various forms of abnormal hyperplasia some or all of which are found in the breasts surgically treated for so-called chronic mastitis.

Figure X shows excessive lobulation and well marked periductular connective tissue which by its growth is tending to deform and contract a moderate sized duct, thus suggesting the early stages in the evolution of a periductular adenoma.

Figure XI show excessive lobulation and simple ductular dilatation.

Figure XII shows generalized ductular dilatation somewhat resembling the appearances seen in residual lactation acini. Note the apparent absence of periductular connective tissue.

The hypertrophic periductular connective tissue associated with the excessive lobulation of acinous hyperplasia on the one hand and its absence in the presence of ductular dilatation on the other suggests that this tissue plays an important part in the determination of the architecture of the parenchymal lobulation. In the processes of evolution and involution its rôle has already been discussed. In evolution it apparently paves the way for the developing lobules causing atrophy of the fibrillar stroma in its onward march and by its intimate connexions with the developing acini moulds them into a lobular arrangement, finally atrophying in its turn when its work is finished. In involution, after the stage of collapse and disintegration of the lactating acini, the proliferation of the periductular connective tissue again helps to reform the resting lobule. One can readily understand a tissue with these potentialities for growth and atrophy being easily involved in pathological processes. What is the stimulus for its growth? Is it the secretion in the glandular elements?

Figure XIII from the same patient shows epithelial changes in the walls of a large duct, surrounded by excessive lobulation and dilated ducts, as in Figure XIII. It is possible that the epithelial changes in the large duct were responsible for the bleeding from the nipple.

Figure XIV shows simple retention cysts without epithelial changes from the breast of a spinster, *ætatis* forty years, who complained of a painless lump in the breast. The whole of the breast felt somewhat thickened and knotted, but an exploratory operation only was performed and an immediate microscopical section was made on the small piece removed for examination. Subsequently

the patient was kept under observation for three years without any further development.

I do not consider that changes such as these are of serious import. They are often found in the routine examination of breasts removed at autopsy and in a series of fifty such breasts examined by myself these changes in a greater or less degree were found in nearly 25% and the incidence was greater in the childless woman. The frequency with which one finds on the routine examination of breast tissue from all sources simple retention cysts without any epithelial proliferation and with often very little other evidence of a change from the normal except this simple cyst formation, makes it difficult to follow the logic of Cheatle's assumption[4] that "proliferation of epithelium is the important factor in cyst formation and that cysts form to accommodate the epithelium."

Changes in the Ducts.

This section contrasts very strongly with the next series of sections that are shown to illustrate a further advance in the epithelial changes in ducts seen in Figure XIII, changes that show a progression in epithelial metaplasia going right up to true duct carcinoma.

Figure XV is from a woman, *ætatis* thirty-seven years, a *multipara*, whose youngest child is three years old. She gave a history of pain in one breast and on examination there was a localized tender thickening with enlarged tender glands in the axilla. Microscopical section revealed a further advance in epithelial changes in cystic ducts. Note the atypical epithelium and the tendency to interductular growth. Other areas show simple cysts and residual lactation acini.

Figure XVI shows portion of the wall of a large cyst with atypical epithelium and papillary projection.

Figure XVII shows further complication of the epithelial hyperplasia with the formation of interdendritic growth well seen at *A*, which is a cyst resulting from a congeries of dilated ducts the intervening walls of which have partly broken down. At *B* the lumen of a cyst is completely filled with a similar interdendritic development.

Figure XVIII shows a larger interdendritic growth in the centre of a cyst. This is the appearance seen in the so-called papillary adenoma or duct-papilloma and although the condition may remain for a considerable time confined to the walls of one or more ducts, there is evidence that such a condition is probably the early stage of a duct carcinoma.

Figure XIX is a section from a duct carcinoma of the breast with secondary involvement of the axillary glands. Note in this primary growth fibrous septa, probably the thickened walls of old cysts separating branching masses of epithelial structure in which there is an attempt at the formation of acini.

Figure XX shows an exact replica of the process in one of the involved axillary glands.

Figure XXI is from another gland and shows further metaplasia into a spheroidal or medullary form of growth mixed with areas in which there is an attempt at acinous formation.

Figure XXII is from a woman, *ætatis* thirty-five years, who was seven months pregnant and who complained of a sanguineous discharge from the nipple for three to four months. She had four children, but had never been able to nurse them. On examination there was no palpable tumour, but the breast was removed for prophylactic reasons. In one of the large ducts beneath the areola a cyst the size of a pea was found filled with papillary growth. The section shows the wall of the cyst containing interdendritic carcinoma contrasting with the adjoining lactating breast tissue.

Carcinoma from the Ducts.

The next series of slides shows the actual evolution of carcinoma of another type obviously taking origin from dilated ducts. They are from a woman, *ætatis* thirty-seven years, who gave a history of a lump in the breast noticed for two years. This had all the characteristics of a typical scirrhous carcinoma.

Figure XXIII shows numerous cysts and cystic ducts, some lined with simple flattened epithelium and others with large atypical epithelial cells. Papillary projection and desquamation are much in evidence and there is a pronounced tendency towards filling of the ducts. At *A* and *B* the epithelium is obviously malignant.

Figure XXIV is from the same patient and shows the development of a feathery type of epithelium, contrasting with simple walled cysts.

Figure XXV shows malignant epithelium tending to fill the ducts.

Figure XXVI shows the same condition in association with excessive lobulation.

Figure XXVII shows the same type of epithelium growing more diffusely and growing beyond the confines of the ducts.

Figure XXVIII gives a typical picture of scirrhous carcinoma with at *A* and *B* ducts filled with carcinoma similar to those shown in the previous three slides. This section is taken from the centre of the tumour the size of a large walnut and clinically diagnosed malignant. The previous five slides (Figures XXIII, XXIV, XXV, XXVI, XXVII) were taken from different parts of the same breast from tissue which to the naked eye did not resemble carcinoma in the least and which by palpation methods could not possibly have been diagnosed as such. The only abnormalities apparent to the naked eye were numerous small cysts.

These histological pictures are very illuminating in the further light they throw on the origin of cancer from ducts. We have seen in Figures XV, XVI, XVII and XVIII (the last series) evidence suggesting the origin of the common form of duct carcinoma from the larger ducts and cysts. Here we have a definite evolution of a totally different type of carcinoma from a similar origin. It further illustrates the fallacy of attempting to give an opinion on the presence or otherwise of cancer from the macroscopical appearances of the breast tissues. Eight contiguous pieces of tissue, taken in a line extending from the scirrhous tumour to the periphery of the breast, were sectioned and the changes towards malignancy became progressively greater the nearer the tumour was approached. This series surely justifies the statement that there is a relationship between abnormal hyperplasia and carcinoma and gives further evidence of the origin of cancer, not necessarily the classical duct carcinoma, from duct epithelium.

Adenomata.

We now come to a most interesting series of microphotographs, a study of which should alter the time-honoured view of the essential innocency of adenomata *per se* and of the breasts in which they arise and greatly modify the accepted surgical treatment.

An examination of an adenoma lying intact in a breast shows that the capsule is not always a true one, but only a condensation of the adjacent stroma.

An examination of the apparently healthy breast tissue in a breast containing an adenoma or a cancer frequently shows small unsuspected adenomata and areas which by their structure can be described only as adenomatous. Were these separable from the surrounding breast tissue, one would have no hesitation in frankly classing them as adenomata.

The underlying pathology of adenomata is therefore not so simple as has been taught in the past. Cheatle[5] in his excellent work on whole sections of the breast states that: "Unsuspected fibro-adenomata . . . occur in 28% of all breasts containing carcinoma; this is probably a low estimate."

A demonstration of the various types of fibro-adenomata of the breast would serve no useful purpose in this paper and those shown are of interest not on account of the particular type of adenoma so much as on their relationship to abnormal hyperplastic conditions already described in other connexions.

In Figure X a duct contracted and distorted by the hypertrophy and pressure of the periductular connective tissue was shown previously and described as the earliest suggestion of the development of a periductular adenoma.

Figure XXIX is from the breast tissue near the bed of an adenoma and shows a further progression towards the same development. Note the entire absence of a capsule and the presence of small lobules adjacent to the periductular connective tissue.

Figure XXX is a photograph of the adenoma in the same breast which revealed itself by classical clinical signs. Note that it is a different type from the commoner periductular adenoma and that differentiation from its surroundings is occurring not by the development of a capsule but by condensation of its own fibrous tissue.

The Bed of Adenomata.

The next slides show changes in the breast tissue of the bed of adenomata and lend further weight to the view that tumours, including adenomata, are not isolated developments in the breast.

Figure XXXI is from a woman, *ætatis* thirty-one years, who complained of a lump in her breast for some months. On examination she had the classical physical signs of a fibro-adenoma. The adenoma was easily enucleated at operation, except at one spot and an immediate microscopical section was made of a piece of tissue cut from the bed of the tumour. This showed the appearances to be seen in Figure XXXII. Figure XXXI is the histological picture of an intracanalicular fibro-adenoma.

Figure XXXII is a section from the bed of the adenoma and shows simple retention cysts with and without secretion cysts lined with atypical epithelium and cysts containing interdendritic growths identical with other slides shown this evening (compare Figure XVII).

Figure XXXIII is from another portion of the adenoma bed and shows excessive lobulation in addition to duct changes.

The question arises: What is the relationship between the two conditions? The association of adenomata with abnormal hyperplasia is so common that one is forced to the assumption that the two conditions have a causal relationship and that what we describe as a tumour because of its apparent isolation by a capsule, is only the local or clinical expression of other pathological changes.

Figure XXXIV is from another type of adenoma, a glandular type in which the periductular connective tissue is not in evidence.

Figure XXXV is from the contiguous breast tissue and shows excessive lobulation and stroma condensation.

Localized Fibro-Adenoma.

The next slides are from the case of a localized fibro-adenoma and are very interesting in the demonstration of associated ductular epithelial changes in the surrounding breast tissue, changes very similar to those seen in the slides which I claim illustrate the evolution or histogenesis of a carcinoma. The macroscopical specimen is on view and gives no hint of the astounding histological picture.

Figure XXXVI is a photograph of the typical intracanalicular fibro-adenoma found in this breast.

Figure XXXVII is a photograph of an adenomatous unencapsuled area in the bed of the adenoma and shows suspicious epithelial changes in the ducts deformed by the overgrowth of periductular connective tissue.

Figure XXXVIII is from an area apparently normal to the naked eye, except for the suggestion of a mild cystic change and shows ducts and cysts containing feathery epithelium and masses of cells that are frankly malignant. Compare this with Figure XXIII which was shown as a condition associated with the development of a carcinoma. Does not this suggest that the underlying basis of both innocent and malignant tumours is a common one?

The next slide (Figure XXXIX) shows a very rare condition in the development of an interdendritic carcinoma in the centre of an adenoma the type structure of which is shown in Figure XL. Probably the condition is one of mild malignancy and of slow development and should not necessitate the performance of anything more than removal of the breast tissues.

We now will study the case of Mrs. J.M., who was mentioned in the introduction to this paper as being responsible for the research into the histogenesis of tumours presented in this paper.

Figure XLI is from a section taken from the adenoma removed at the first operation and gives the picture of a typical periductular adenoma.

Figure XLII is from a section of the piece of tissue adherent to the adenoma and shows excessive lobulation and retention changes in ducts and the development of carcinoma in the acini lobules.

Figure XLIII is from the carcinoma that appeared seven weeks after her first operation and was responsible for her death. It gives the picture of an obvious fairly active spheroidal carcinoma.

Had the operation of enucleation been replaced by the procedure to be outlined later in the remarks on the treatment of adenomata, it is possible that this woman would be alive today.

Lastly, in order to complete the account of the forms of abnormal hyperplasia that I have come across during these investigations, I will show a case of macromastia resulting from abnormal hyperplasia.

Figure XLIV shows an enormous breast which weighed four kilograms (nine pounds) and had grown in the seven years following the birth of her last child.

Figure XLV represents the appearances shown in sections taken from various parts of the breast and it can be seen that there is more or less uniform involvement of the whole duct system by dilatation and distortion. Other areas in this breast showed macroscopic cysts and the condition is probably an example of Brodie's sero-cystic disease.

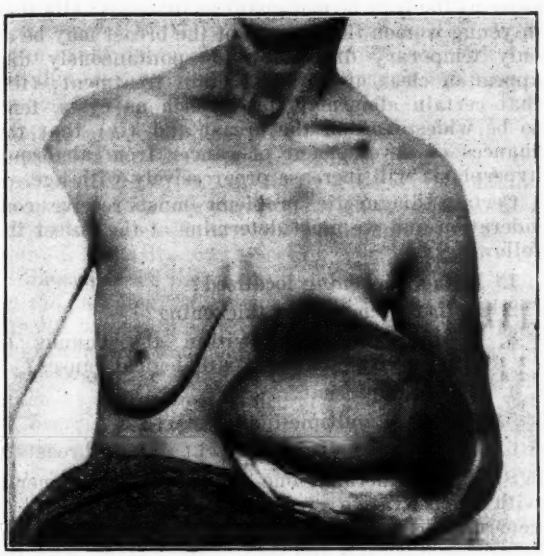

FIGURE XLIV.

General Observations on Abnormal Hyperplasia.

The slides shown demonstrate the departures from the normal seen in thickenings of the breast from various sources that have been already specified. They may be classified as: (i) Excessive lobulation and acinar hyperplasia, (ii) ductular dilatation and cyst formation, (iii) epithelial changes in ducts and cysts.

In practically every case of carcinoma of the breast that I have examined during the last seven years one or more of these changes has been present, either immediately surrounding the carcinoma or spread generally through the breast tissue. Changes like these are found in so-called chronic mastitis.

The term chronic mastitis is, in my opinion, a misleading one and implies that the histological appearances found are due to inflammation. In the first place no bacterial cause has been discovered and secondly, the accepted criteria of chronic inflammation, such as fibrosis and round-celled infiltration, are not found in most of the cases. Even the presence of round-celled infiltration must be discounted in this connexion, for the growing acini in the breast in the third month of pregnancy are usually surrounded and intermingled with small round cells. True fibrosis is not present, for we cannot define the nuclei of inflammatory fibrous tissue and such conditions as stroma hyperplasia and stroma condensation have been wrongly classed as inflammation.

The practical bearing of this criticism is that the acceptance of an inflammatory origin has led to the treatment of the condition as such and to a dangerous conservatism.

Surgeons must have observed in enucleating an adenoma that difficulty is frequently experienced at one particular spot and that it is often necessary to remove with the adenoma a small piece of adherent breast tissue. Examination of this adherent tissue and of the bed in which adenomata lie, frequently reveals similar abnormal changes to those described above. It is not an infrequent experience for a patient to consult her doctor on account of a lump in the breast which examination shows is a typical carcinoma, and to give a history that in some previous time in her life she had had a tumour removed from the breast which a competent pathologist had pronounced as an adenoma.

An examination of the breast tissue in cases of cystic disease of the breast and by this I mean cases diagnosed as single or multiple cysts by the clinician irrespective of the particular clinical history or findings, gives histological pictures confined to some or all of the appearances shown tonight.

It therefore seems artificial to attempt to classify so-called "chronic mastitis" into the textbook types such as "chronic lobar mastitis," "chronic cystic mastitis" and so on. The various types are all part and parcel of the one disease process. Microscopical if not macroscopical cysts are present in all of them and examination of cystic breasts shows that with the exception of the rare hydatid and perhaps the galactocele there is no such thing as a single cyst in the breast.

Finally, we may conclude that the development of cysts and of tumours, whether innocent or malignant, is not an isolated phenomenon, but really the local expression of a more widespread or even general change in the breast tissues and must have a strong influence on our treatment of thickenings in the breast that have not the clinical signs of cancer.

Ætiology.

The ætiology seems bound up with the remarkable and sensitive reaction of the breast to stimuli of various kinds.

We have seen the extraordinary evolutionary changes that occur as a result of the stimulus of lactation, changes whereby the insignificant parenchyma of the virgin breast almost completely replaces the stroma and finally in its turn atrophies in the process of involution with an ultimate restitution in the resting breast almost to the virginal state.

In the newly-born there is often a swelling of the breasts in both sexes with the secretion of a milky fluid. In the pregnant woman the stimulus is probably from fœtal products, in the new-born child from the maternal blood.

During menstruation swelling of the breasts, with or without pain and tenderness, is common and occasionally there is a definite secretion from the nipple. Again in both sexes similar conditions are met with in the "mastitis" of puberty. These stimuli are probably endocrine in origin. That chronic mechanical irritation and repeated trauma play a part in the ætiology of localized breast thickenings is well illustrated in the following cases.

Mrs. W., widow, *ætatis* thirty-eight years, a tile worker, consulted me because she had been advised to have her breast removed by another doctor. She refused operation. On examination there was a localized diffuse tender thickening occupying the upper outer quadrant of the breast with slightly enlarged tender axillary glands. Her occupation consisted in lifting a group of tiles from a shelf above her head and holding them against her breast whilst she piled other tiles on top of them. She suggested herself that her occupation may have been a causative factor and, acting on this hint, I recommended an immediate change of employment and firmly bandaged the breast. The bandaging was repeated twice weekly for three weeks by which time the thickening was considerably reduced and in some six to eight weeks later the breast had returned practically to normal.

Mrs. R.S., *ætatis* twenty-eight years, complained of a swelling of both breasts in the lower outer quadrants and on examination she had large heavy breasts and a bilateral condition was found similar to that in the breast of Mrs. W. She had noticed the swellings and pain in her breasts after practising intensive club swinging for a competition. She was ordered to stop club swinging immediately and was bandaged. There was relief of pain after a few days and she failed on this account to report for further treatment. She was seen again a few months later with normal breasts.

Mrs. B., *ætatis* forty-two years, complained of tender thickenings at the lower margins of both breasts. On examination each breast had a crescentic tender thickening which corresponded to the areas pressed on by ill-fitting corsets. Support by a well fitting *brassière* and the discarding of the corsets produced a cure.

One could multiply such instances. There is no proof in these cases of the histological picture present, but it is fair to assume that the thickening was due to abnormal hyperplasia or excessive secretion due to mechanical stimulation with disturbance of the balance between secretion and absorption.

Further light is thrown on this problem by the relief after marriage of symptoms of swollen, tender and painful breasts at menstruation. Is the underlying factor in the production of abnormal hyperplastic states the result of civilization? Is it bound up with the unnatural sex life and evasion of the responsibilities of motherhood and lactation so common in civilized woman?

And why does cancer develope in some of these hyperplastic conditions? Can it be that the dilated ducts and cysts with their retained secretions either by the development of an irritating chemical body in the altered secretion or from the toxins of an infecting organism act as the soil for the as yet undiscovered cancer factor to work?

Treatment of Thickenings of the Breast.

By a thickening I mean a condition of abnormal consistency, discovered by palpation, not having the clinical signs of cancer as taught by the textbooks. The latter are really the physical signs of advanced and most often fatal cancer. The position is one of great difficulty in determining a rational course of treatment between unnecessary multilation on the one hand and a dangerous conservatism on the other. A good deal of common sense is required and one must bear in mind: (i) that, although the development of cancer in the breast is usually a slow process, every thickening must be treated with suspicion, as statistics from various sources are in agreement that a lump in the breast is more than twice as likely to be malignant as innocent; (ii) that in young women thickenings of the breast may be of only temporary duration and spontaneously disappear or clear up with expectant treatment; (iii) that certain abnormal states, such as cysts, tend to be widespread in the breast and (iv) that the chances of development of cancer from abnormal hyperplasia will increase progressively with age.

Certain diagnostic problems must receive consideration and we must determine at the outset the following:

1. Is the thickening localized?
2. Is there generalized thickening?
3. Is this thickening within the bounds of normality or due to pathological causes?
4. Are cysts present?
5. Are there multiple lumps?
6. Are these conditions present in both breasts?

Speaking generally, one can afford to commence with conservative treatment in the case of generalized thickenings of the breast and in localized thickenings in girls and very young women, with the reservation that age, however, is the dominant factor in our therapeutic outlook on all cases and must be the underlying influence whether the thickening be localized or general.

Localized Thickenings.

In the girl and young woman we can safely be conservative with a localized thickening, if there be a history of any mechanical or other stimulation and put into practice the lesson learnt from midwifery. No one can dispute the fact that properly applied pressure is the factor that will promote rapid involution in the breast of the woman who by loss of her progeny or other circumstances is unable to nurse her child. Regulated pressure, then, by properly applied and repeated bandaging is our sheet anchor in the initial treatment of these patients. I have already shown instances of success by this treatment in the cases mentioned in the speculation in regard to ætiology.

The use of ointments or any form of treatment that involves rubbing I strongly condemn on the grounds that mechanical stimulation will promote secretion. Here again we learn our lesson from midwifery. The mechanical stimulation of the suckling infant is acknowledged as a potent factor in stimulating secretion and actually causing development of parenchyma in a lactating breast. Is it rational to stimulate to still further secretory activity a breast suffering from the effects of retained secretion? If after a few weeks of such conservative treatment there is no improvement or if there is the slightest sign of increase in size or alteration of character at any time before this, the condition should be treated surgically by the removal of the thickened area *plus* an adequate margin of apparently healthy breast tissue and the specimen submitted to immediate microscopical examination.

A thickening should never be cut into, no matter how innocent it appears on clinical examination, as

it has been incontrovertibly shown that cutting into a carcinoma will almost inevitably result in death from rapid dissemination from this cause and it is for this reason that the adequate margin of tissue is emphasized.

Much criticism has been cast on the value of immediate microscopical examination on the grounds: (i) that a sufficiently good section cannot be obtained by any rapid methods of examination, (ii) that there is not sufficient time to form an opinion and (iii) that a section from one piece only of the suspected tissue may not throw sufficient light on the pathology of the condition. These objections can all be overruled by the use of modern methods of examination and modern anæsthesia. Some of the slides shown tonight are from fresh unfixed tissue taken at operations. Objections (ii) and (iii) can be overruled by the use of gas and oxygen anæsthesia. A patient with this form of anæsthesia can be kept in a light and safe state of narcosis for sufficient time to allow of several pieces of tissue to be sectioned and reported on. If it be impossible to give an opinion in a few minutes on a section examined by a reliable rapid method, it is going to be equally difficult to give an opinion on a paraffin section and the diagnosis given in any case is going to be an uncertain one.

In older women approaching the cancer period, that is in women over thirty, with localized thickenings conservative treatment is not justifiable and exploratory operation *plus* immediate microscopical section should be undertaken and the subsequent operative procedure made dependent on the pathologist's report.

Generalized Thickenings.

Cheatle[6] has shown that there is a group of cases of generalized thickening with cyst formation in one or both breasts that arises in the fifth decade and that, once established, becomes permanent and tends to become malignant. He has given the name prœmic breast to this condition and advocates the surgical removal of the breast tissue in one or both breasts as the only safe procedure. Here again, I think, one should use judgement and not class all these thickenings at this age as definitely precancerous. Careful palpation is a good guide and the slightest suggestion of lack of uniformity in the generalized thickening or the presence of fairly easily palpable cysts should lead to the decision of removal of the breast, but it should be remembered that the surgical procedure can and must if necessary be controlled by a pathologist at the time of operation.

Is the Thickening within the Bounds of Normality or Due to Pathological Causes?—It must be borne in mind that there are certain changes in consistency in the breast at various periods of life that alter the ordinary palpation findings. The remarkable alteration in consistency in many breasts during menstruation is a good example of the thickening that can occur from physiological causes. During and after the menopause there are further changes due to alteration of endocrine balance probably and leading to stroma condensation around the changing parenchymal elements. The "corded" sensation of the breast tissues at this time is well known.

In other women irrespective of the particular epoch in life similar corded structure is an apparently normal condition.

In loss of weight from any cause, particularly in older women, the loss of fat renders more evident to the palpating fingers the essential breast tissues. All these physiological thickenings and non-pathological alterations in consistency should be appreciated by the practitioner and I question whether our knowledge of the consistency of the normal breast under the conditions of age, normal involution, physiological stimulation and nutritional states is as complete as it should be.

I submit in this connexion that it is the duty of the practitioner to make a thorough examination of the breasts of every woman who presents herself for a general examination and that this duty should be considered as at least as important as the routine examination of the heart and lungs. Not only would many pathological conditions unsuspected by the patient be discovered, but the practitioner would improve his own knowledge of the variations in consistency that are within the bounds of normality.

Cysts.

There is a growing weight of opinion that there is no such thing as a single cyst of the breast[7] and it is a common experience for the surgeon, on incising a breast to remove what he thought was a single cyst, to find other cysts which were obscured by the larger at the time of his preoperative examination.

In the treatment of cysts age again must be the dominant factor and in the young woman, especially if the condition be bilateral, conservative surgery can be attempted by the removal of the obvious cyst and if on examination of the rest of the breast tissues no obvious cysts are found, the wound can be closed without further operative procedure. But, in the event of recurrence, the whole of the breast tissue should be sacrificed. In the case of older women it is safer to remove the whole of the breast without any preliminary exploration, except for the purpose of obtaining an opinion from an immediate microscopical section.

Multiple Lumps.

In the presence of multiple lumps clearly there is no excuse for conservatism and particularly after the third decade the breast tissues as a whole should be removed and submitted to a thorough pathological examination of each thickening at the time of operation.

Bilateral Thickenings.

In the young woman particularly the problem is a difficult one. Many of the patients are found to have cysts on careful examination, but in others the thickened tissue around tense cysts makes it difficult

by palpation to determine the true physical characters. Multiple small thickenings are of much less serious significance than larger ones, particularly if the former be more or less uniform in size. Each case must be treated on its merits and the services of the pathologist should always be availed of to share the responsibility of diagnosis and treatment and an exploratory operation should never be avoided whenever the condition does not respond to conservative treatment. Unfortunately the surgeon is often faced with the necessity in the interests of his patient of sacrificing both breasts.

Treatment of Adenomata.—If the view be accepted that adenomata are not necessarily localized developments in the breast, operation by enucleation is no longer justified. Adenomata should be removed undisturbed with a margin of breast tissue attached and particularly in older women this tissue, representing the bed of the adenoma, should be examined on the spot microscopically and further surgical measures adopted if indicated by this examination.

Cheatle[5] puts the position very strongly: ". . . it is safer to take away the segment of the breast in which fibro-adenomata grow. The successful removal of a fibro-adenoma by enucleation is the result of a lucky accident."

Acknowledgements.

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Post-Scriptum.

Since delivering this paper, I have been requested to describe the method of section preparation used by myself in the examination of breast tissues at the time of operation.

The method is a simplified modification of one described in the *Australian Medical Journal* in 1911.[8]

The materials required are: (i) Freezing microtome, (ii) plane for section cutting, (iii) large petri dish (about 15·0 by 3·75 centimetres or six inches by one and a half inches), (iv) mounting needles (2), (v) drop bottle containing thionin blue diluted one in three with distilled water, (vi) glass slides and coverslips, (vii) ethyl chloride spray (local anæsthesia).

The steps of the method are as follow:

1. A piece of tissue about three millimetres thick is taken from the specimen and freed as far as possible from fat.
2. This piece is placed on the section carrier of an ordinary freezing microtome with a few drops of water and kept in position by the pressure of a glass slide.
3. The tissue is frozen by a spray from a local anæsthesia ethyl chloride tube, the spray being projected under the platform bearing the specimen until sufficiently frozen. Experience is necessary here in order to prevent the tissue being frozen too hard.
4. Sections as thin as possible are cut with a hand plane and immersed in a large petri dish of water. The petri dish should be placed on a dark background in order to render the sections more readily visible.
5. A thin section is placed with a mounting needle on a microscope slide and stained with thionin blue[1] for a second or two.
6. The section is floated off into water, when the spirit in the stain by virtue of surface tension phenomena will cause the section to spread out flat.
7. It is then replaced on a glass slide and examined under the microscope with or without a coverslip. A coverslip is necessary with examination by the high power objective. In using the latter, depression of the condenser will define clearly cell outlines and nuclear structure.

The whole procedure, if performed by a quick operator, will not take much more than a minute and an opinion in many cases can be given at once. It rarely happens that more than three minutes are required. The finished sections show as much detail as a paraffin section and have the added advantage of giving a more accurate picture of the tissues. There is no doubt that the fixing, dehydrating agents and heat used in the preparation of a paraffin section seriously shrink and distort the tissues and provide sections that are not as good a criterion of the real tissue and cell structure as sections prepared by a method without tissue fixation. The only disadvantages of the method are that sections are perishable and that after about an hour the picture becomes confused by diffusion of the stain. However, if photographed within this time, a good microphotograph can be obtained. Figures VII, XIV and XXXV are microphotographs of fresh unfixed breast tissue examined at the time of operation.

By using the services of a pathologist the surgeon in cases of doubtful thickenings of the breast has an ally at the time of operation that he cannot in justice to his patients do without. The idea that the surgeon can with the naked eye or with his fingers

[1] Formula for thionin blue stain: Thionin blue, 1 gramme; distilled water, 50 cubic centimetres; absolute alcohol, 100 cubic centimetres. This is to be kept as a stock solution and diluted with two parts of distilled water when required for staining. The dilute solution does not keep for more than a week. Thionin blue can be conveniently obtained in the form of "Soloids" (Burroughs, Wellcome and Company, Limited) weighing 0·1 gramme each.

or by section with a scalpel determine the pathology of a thickening of the breast is fallacious and unscientific and may easily end in disaster.

The study of the sections shown in Figures XXIII to XXVII surely confirms this statement. In this particular case the only portion of breast tissue that could be diagnosed as carcinoma with the naked eye was the scirrhous tumour; the rest of the breast tissue was simply thickened and contained numerous small cysts. Had this tissue existed apart from the scirrhous tumour, one would have been justified by its gross appearances in classing it as non-malignant.

THE CONSERVATION OF FUNCTION IN GYNÆCOLOGY.[1]

By VICTOR BONNEY, M.D., M.S., F.R.C.S., M.R.C.P., D.Sc.,
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WHEN John Hunter, the illustrious forefather of scientific surgery, in an oft-quoted sentence declared that an operation was to be regarded as a confession of failure, he had in his mind the ruthless and crude surgery of those days which sought to achieve a cure of the disease by removing it wholesale, unhampered by any considerations of the loss of function that the removal entailed. Surgery of this sort was obviously a very second rate method of cure, compared with successful medicinal treatment, which not only cures the disease, but leaves function unimpaired. This type of surgery may rightly be regarded as a confession of failure to achieve the ideal.

The modern surgeon has passed beyond this and endeavours by his operation not only to remove the disease or deformity as the case may be, but also to leave the patient functionally perfect. It is true he is not always able to carry out the ideal and probably never will be able to in every case, but at least he has the goal constantly before his eyes and when he is compelled to adopt those cruder tactics of the old surgeons which are best summed up in the phrase "chop it off," he does so with regret and with full consciousness that the course forced upon him is a confession of failure or at least only second best.

As surgeons we have to consider not only the removal of the patient's complaint, but the cure of the patient and the two things are not synonymous, for the cure of the patient implies a full restoration to normality. The mere removal of the complaint may be and often is effected at the expense of permanent loss of function of the part.

In gynæcology we have to deal with various diseases and deformities of the female genital organs and I thought it might interest you to discuss how far modern practice and methods have gone in the direction of curing the patient and not merely removing the complaint for which she comes to us.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on April 27, 1928.

The Uterus.

The value of the womb to a woman is partly material and partly sentimental. On the material side we have the functions of child-bearing and menstruation. In regard to child-bearing its value has to be individually assessed according to the desire for maternity. The maternal impulse varies very much in its strength in different women. There are some in whom it seems to be absent altogether, whilst in others it is an impulse that dominates the whole of the mental outlook. Few women, I think, have not desired a child at some time or other. Moreover, one has to remember that to certain men the main attraction of marriage is the possibility of having children and that the definite loss of that possibility, even though it has only remained a possibility throughout their married life, alters their feelings towards their wife. As regards menstruation, its value in the economy is not fully known. It has been described as merely an outward and visible sign to the male that the female is able to conceive. Beckwith Whitehouse considers it as a monthly abortion of the developing decidua of an unfertilized ovum and the menstrual discharge as the lochia of that abortion. To what extent it influences a woman's general health seems problematical. Most women feel unwell at these periods, but there is a proportion in whom the monthly flow brings a feeling of well-being.

We have no definite knowledge of its effect on the ovary. It is certain that the latter continues to function after the uterus has been removed, but I agree with my colleague, Arthur Giles, who, as a result of a long investigation, came to the conclusion that the climacteric atrophy of the ovary supervened on the average two or three years sooner than normal in women who had undergone hysterectomy.

So much for the material value. What about the sentimental value? Here we embark on a still more difficult subject for the reason that women are mostly unwilling to disclose their full thoughts on this matter. For instance, all of us who have had much experience, are familiar with the woman who states that she dislikes children and is glad she has not any, would not indeed have them if she could; and all the while the pathetic truth keeps peeping out. It is the same with many women who have had the organ removed. They say they are glad or do not care, but in reality they care very much. To many women the sentimental value of the uterus is immense, for to them all femininity is summed up in it nor can you prevail on them to take any less sweeping view.

Hysterectomy in such women leaves a perpetual bitterness and regret. There are others, of course, who would welcome the removal of the organ if it could be done easily and safely—notably those who have had a number of children.

The difficulty is that we have no means of judging surely in the individual patient what the sentimental value of the organ is to her even at the time we see her and still less of judging what that value

may be in retrospect five years after we have removed it.

We have also to consider certain sexual factors which come into play in the matter. The sex sense is a very variable one in individuals, both as to what initiates it and what governs it. As regards women there are many in whom the idea of maternity is the central idea round which all the rest congregates. Take away the possibility of conception and the whole fragile and elusive complex ceases to exist; but we have no means of distinguishing these persons. As regards men similar variations and vagaries obtain. Thus the idea of paternity may be the central idea in the sex relation complex, though less frequently than the corresponding idea in the female, and when paternity is impossible, the whole idea falls to the ground.

I am not implying that in this class of men and women the procreation of a child then and there is desired. They may be using every known form of preventive against it. The potentiality for parenthood is what matters. The sex relation complex in many men is weakened or ceases to exist altogether when confronted with the suggestion or knowledge of disease or deformity. All of us must be familiar with the man who makes the operation performed on his wife an excuse for an illicit alliance, a loathesome type of fellow, but one with whom we have to reckon.

The objection to hysterectomy is often founded on a degree of understanding of these facts. A woman of this sort compelled to lose her uterus will very often suspect her perfectly innocent husband and read into every little imagined slight a loss of affection "because she is not as other women are." The importance of these psychological considerations is very great and the more so because you cannot learn out of textbooks on operative surgery nor even gynæcology.

It requires years of close observation and remembrance of what you have observed, the cultivation of sympathy and understanding and a knowledge of the world, in short all those things that come with age as a partial compensation for the lost optimism of glorious youth.

There are, of course, many uterine conditions for which hysterectomy is the only treatment to be considered, but, conversely, there are many in which it should be and can be avoided. The most notable of the latter are a considerable proportion of cases of fibroids.

Many operations of hystereetomy that I have performed, have not turned out as well as I had hoped. The results in some cases have been disastrous, not surgically, but socially and psychologically, and it is evident that wherever possible one ought to do something better than "chop the uterus off." One would not so easily chop off a leg, for its usefulness is more obvious. In patients with uterine fibroids I have come to do myomectomy on an increasing scale. The removal of a number of fibroids was formerly thought to be dangerous from hæmorrhage or sepsis and it was also said by some: "What is the use of retaining an organ so hacked about?" These objections, however, are not valid, because it is possible to remove many fibroids from a uterus and retain its functions even to child-bearing. The original paper by Alexander came to my notice twenty-five years after it was given, although he laid down his principles not long before I commenced work at the Middlesex Hospital. He held that all fibroids should be removed through one incision in front of the uterus and the cavity in the uterine wall packed with gauze. The latter is not now done, but the single incision still remains correct and has the advantages that there is less danger of oozing and any that does occur, is between the uterus and the bladder, with less danger of oozing into or infection of the general peritoneum or of causing coils of intestine to become adherent to the back of the uterus and thus leading to intestinal obstruction later. At first I used to attempt to minimize the dangers of hæmorrhage by being very quick, literally racing with death and sometimes it was a close call. I later exposed and clamped the uterine arteries, but I now use myomectomy clamps which control the uterine arteries and at the same time clamp the ovarian ligaments. One must attempt to remove all the fibroids and done this way the operation is a very satisfactory one.

I have performed this operation between three hundred and three hundred and fifty times and the greatest numbers of fibroids I have removed are ninety-five, eighty and fifty-three respectively. I have removed twenty, twenty-five and thirty quite frequently.

The operation is more interesting than hysterectomy, as it gives scope for the surgeon's ingenuity. The uterine wall is often very hypertrophied around the fibroids and one has to deal with a large and deformed uterus. After myomectomy involution occurs and although the organ may be hypertrophied when it is replaced after operation, it may return to normal in two or three months. It must not be replaced in too hypertrophied a condition as the menorrhagia may continue together with other abnormal symptoms. Some ingenuity must, therefore, be used in deciding how much to remove, but it should be remembered that myomectomy can be done in almost every case of fibroids.

By the older surgeons it was said to be impossible to remove multiple fibroids successfully and to leave a useful organ, therefore it was done. It is this refusal to be conquered by the apparently impossible that has led to the ascent of man and marked him off from the beasts.

I believe that myomectomy is the operation of election in all women up to forty-three years of age. I have done it in older women, if they wished it, explaining that it was associated with a little more risk than hysterectomy.

My mortality, under 2% for myomectomy, is as good as the usual mortality of hysterectomy for fibroids which is about 2%.

Some of my patients have borne children after myomectomy. I used to perform Cæsarean section in these women, but I found that it was not necessary. In some instances the women choose hysterectomy because it offers the best chance of a living child.

When one is treating uterine disease, one should try to estimate the functional, domestic, social and psychological value of the uterus in each particular woman before deciding to remove the organ.

The Ovary.

The ovary governs the course of development from childhood to womanhood and, this attained, it provides the mature egg cells necessary for the continuance of the race and by means of its internal secretion controls the menstrual function and the nutrition of the uterus and vagina and exercises a directive force over feminine mentality in general and the feminine sex complex in particular.

Its exact value, however, varies with the individual. The old legend that spaying an adult woman caused her to become manlike is, of course, without foundation, though the case is different when the operation is performed on children. The contrary rather obtains, namely that it brings into prominence certain feminine traits such as hysteria, self-consciousness and nervous instability to an abnormal degree. The extent to which an artificial menopause produces these effects is very variable. Some women can lose both ovaries in relative youth and remain little altered in their general mental poise, whilst in others the operation is followed by the severest menopausal symptoms. What accounts for this difference is not known, but it is assumed that the ovarian function is strongly supplemented in some persons by the secretions of other glands, the adrenal, the thyreoid and so forth. One effect of spaying is relatively constant, namely atrophy of the uterus and vagina. This is accompanied by a loss, more or less rapid, of the sex sense, though I have seen women in whom there appeared to be no diminishment of this sense.

The atrophy of the vagina is the most serious part of these physical changes since, when it occurs in a young woman, she becomes unfit for marriage. The value of the ovary lessens with years, but with no certainty in the degree or rapidity of the change and after bilateral oophorectomy menopausal symptoms may be as violent at fifty as at twenty. We have then no means of measuring the ovarian value in any individual and it therefore follows that the ovaries or at least one ovary should be conserved. As a fact there are but few conditions in which it is really necessary to remove them.

In dealing with conservation of the ovary it is convenient first to consider cysts: follicular cysts, blood cysts, dermoids and solid fibromata. In my experience most women under the age of the climacteric are still menstruating even with large bilateral cysts of the ovaries, proving that there still remains some functioning ovarian tissue. I used to remove the whole of the ovary in such cases, but I found that most cysts could be enucleated, as can some fibromata and solid adenomata. A dermoid cyst as large as a coconut can be enucleated by splitting the thin capsule of ovarian tissue and bunching together with sutures the residual capsule which represents the remains of the ovary. All follicular cysts can be dealt with by opening the capsule and gently shelling out the cyst with the handle of a scalpel. The nature of ovarian blood cysts or chocolate cysts is uncertain, but one type of these cysts has increased in frequency within my memory. I think they are due to intrafollicular or intraovarian menstruation. When the follicle dehisces, some epithelium from the tube finds its way into the follicle, giving rise to a blood cyst. These cysts are common in young women, often in unmarried or recently married women who complain of pain. If examination reveals a thickening on either side of the uterus, one should suspect a blood cyst. When the abdomen is opened, the ovaries may be found to be enlarged and adherent to surrounding structures. I used to remove the ovary in this condition, but I found that all these cysts could be enucleated. I now adopt this procedure and I have not had to operate a second time for this condition up to the present.

Next, let us consider the conservation of the ovary in relation to inflammation, which is seldom primary but usually secondary to salpingitis. I am in favour of operating on acute salpingitis immediately, as it is rare for a tube so affected ever again to become patent and capable of carrying an ovum. I am against the policy of treating acutely inflamed tubes by waiting. One may wait for weeks and the patient becomes no better, but worse and she will have pus not only in her tubes, but in her ovaries as well and her adnexæ will be a mass of adhesions. These lead to tears of the bowel on attempting removal with subsequent danger of fæcal fistula. The patient may eventually get well, but she leaves the hospital without her ovaries. I favour early operation for acute salpingitis mainly with the view of saving the ovaries. Other points must be considered. Suppose, for instance, that one has removed the tubes for acute inflammation. It is necessary to lift the ovaries out of the pelvis by shortening the round ligaments or by ventrofixation of the uterus, to prevent later ovarian adhesions and cyst formation. In the older form of hysterectomy the ovaries used to be removed also, quite unnecessarily, because it was thought to make little difference to the after results. I have no use for this argument. A surgeon who removes normal tissue merely for expedition, is in my opinion a poor type of surgeon. One cannot tell for certain what the effect of removing the ovaries will be. I protest against removal of the ovaries for so-called ovarian pain or inflammation. I doubt if these organs are painful when not the seat of gross disease. It is always the right ovary which gets little cysts on it which are removed at the same time as the appendix at operation. Many young girls have lost their right ovary for small cysts. I think that most cases of so-called

ovarian pain are due to chronic appendicitis, tender mesenteric glands and similar conditions. Admitting that an acutely inflamed tube may recover its patency, though I have never seen it, then the ovary is still more valuable than the tube. In some cases lately I have slit the tube up and drained it and the patients have done well; but I have not heard of a single patient who has become pregnant. Regarding chronic salpingitis and chronic disease of the appendages, the operation of salpingostomy has been improved with Rubin's introduction of tubal inflation. I do not use Rubin's apparatus, but a simple bulb introduced through the vagina. If lumps are felt in the pelvis and air is found to pass through, then they are not chronically inflamed tubes, but may be ovarian. When air does not pass on opening the abdomen, it can be seen where the obstruction is and when such chronically inflamed tubes have been slit up and drained, pregnancy has followed in some of my patients. When the blocking occurs at the uterine ostium, the case is most difficult. I have not had very good results. I usually excise the tubes and reimplant them in the uterus elsewhere, but this operation is a little tricky.

In conclusion, let me repeat the dictum with which I started: The ideal of surgery should be the restoration of normality and any operation which falls short of this, is, as John Hunter said, a tacit confession of failure.

We cannot always attain the ideal, but the man who always sees it shining in front of him, will not often fail; and, when he fails, he fails honourably.

SOME NOTES ON THE TREATMENT OF OTITIS MEDIA AND ACUTE MASTOIDITIS IN CHILDREN.

By LESLIE J. MIDDLETON, M.B., B.S. (Melbourne), F.R.C.S. (Edinburgh),
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THE somewhat unsatisfactory method of treatment of *otitis media* so often seen prompts me to offer this article, being in the main the details of the treatment carried out at the Hospital for Sick Children, Great Ormond Street, London.

Maybe it will be of interest, even if not of value, to some of those who in general practice are obliged to do their own surgery.

So frequently do we see a child who has had a "running ear" treated by means of "drops" without any effort having been made to treat the source of the trouble and thus to establish a permanent cure. The result is that the condition recurs at intervals and not uncommonly the more serious extension into the mastoid air cells takes place.

Some general facts concerning middle ear inflammation are worthy of mention before a rational line of treatment should be discussed. The tympanic cavity of the child is an irregularly shaped space communicating with the naso-pharynx by way of the Eustachian tube. The mucous membrane of these parts is continuous. The cavity is also continuous with the mastoid antrum and mastoid air cells.

Thus we are concerned with an area which is susceptible to inflammatory infections and any condition affecting the upper air passages of the child, for example, measles, scarlet fever, unhealthy tonsils and adenoids *et cetera*, is apt to spread to the tympanic cavity and its surroundings.

Catarrh of the Middle Ear.

Catarrh of the middle ear, which may be the early stage of a suppurative *otitis media*, is very common in children and it gives rise to earache. The pain which is the urgent symptom, may be exceedingly severe and is generally accompanied by some fever. In infants and young children there may be no pain, fever of mild degree running on for some weeks being the only manifestation of the condition.

It is essential that the *membrana tympani* be carefully examined; an electric auriscope is of the greatest value in examining children. Some hyperæmia will generally be noticed. The membrane will also probably be seen to be "indrawn" with the normal light reflex absent. These are the conditions we should expect to find in the early stage. Later the membrane bulges. Should the process go on to suppuration, the membrane will be seen to become red, congested and bulging. At this stage paracentesis is indicated, otherwise the child endures the agony until the membrane perforates.

Treatment.

In the catarrhal stage so long as there is no bulging a few drops of *glycerinum acidi carbolici* will suffice to allay pain. Hot fomentations over the affected ear are also very comforting. It may be necessary to incise the membrane.

Suppuration of the Middle Ear.

Aural suppuration is very common in early childhood. Measles, scarlet fever and diphtheria are all liable to be thus complicated. The most common cause, however, is the common cold.

As regards bacteriology the streptococcus is the most common organism. The pneumococcus is not uncommon and the symptoms then are generally of a milder nature. An apparently symptomless course is often followed when the pneumococcus is the offending organism, be this in middle ear, peritoneal or bone lesions. Typically a child is brought with an unmistakable mastoiditis of perhaps a few days' duration, but this is of almost symptomless nature. The rule is that it is pneumococcal in origin.

The tubercle bacillus, of course, must not be forgotten in the chronic cases.

In the suppurative type of middle ear disease the symptoms are much more severe than in the catarrhal type. The pain is much more severe. The temperature is elevated to a higher degree and there is considerable general disturbance of the child's health.

Treatment.

The ear drum will be definitely congested and call for immediate incision which is followed by an outpouring of pus and prompt relief of symptoms.

The incision which must be free and sufficient, is made with the aid of a good light through the posterior part of the membrane by means of a fine myringotomy knife. The after treatment consists of a careful toilet to the external auditory canal, cleansing with an alkaline lotion and the instillation of spirit drops.

Chronic Middle Ear Disease.

More often perhaps the child is not seen until the ear has been "running" for some time. During this interval there may have been periods of freedom from discharge. Discharge and some attendant deafness are generally the symptoms. It must not be forgotten that a percentage of the chronic cases is tuberculous in origin. In these mixed infection occurs with spreading destruction of the membrane, ossicles and surrounding bone.

General Treatment.

The essential point in treatment is to look for the source of trouble and attack it. This is always in the naso-pharynx and the otitis must be regarded as a secondary condition. For the treatment of the discharge the following local measures are carried out.

The auditory canal is first of all cleared by means of an alkaline lotion such as the following:

Chlorate of potash	0·6 gramme (10 grains)
Bicarbonate of soda	0·6 gramme (10 grains)
Chloride of sodium	0·6 gramme (10 grains)
Purified borax	0·6 gramme (10 grains)
Water, to 30 cubic centimetres	(one fluid ounce)

The canal is best gently syringed out with this lotion and then carefully dried out by means of small mops of cotton wool.

In the second place the canal is treated by the instillation of either iodoform powder or drops made up as follows:

Boracic acid	1 gramme (16 grains)
Spiritus vini rectificatus	16 cubic centimetres (4 fluid drachms)
Water, to 30 cubic centimetres	(one fluid ounce)

This treatment must be carried out as often during the day as the rate of discharge requires.

The essential part of the treatment, however, is the attention to the throat. Tonsils and adenoids in all cases are removed. Very often the local treatment to the aural canal will cause the discharge to cease, but very probably it will break out again at a future date.

I would here pause to add a word on the method of removal of tonsils. For some years past the guillotine has been an obsolete instrument at the Hospital for Sick Children. In every case the tonsils are fully enucleated.

Before it was my privilege to join the house staff at Great Ormond Street, the only method of tonsillectomy that I knew was by means of a guillotine. As the result of three years' experience in the Hospital for Sick Children, during which time many patients were operated on, I would not use a guillotine for tonsillectomy. Although a few experts can completely enucleate the tonsils with the guillotine, I am certain that the work of the vast majority of those who "remove tonsils" is unsatisfactory. How often does examination reveal large pieces of tonsils in each fossa in patients whose tonsils have been "several times removed"?

If the tonsil is such that it warrants removal, then it must be completely removed. I think that tonsil surgery, like that of hernia, is looked upon as being easy and consequently in both these branches much unsatisfactory work is done.

When a proved surgical method for removal of tonsils has been devised and described, it is rather a pity that the non-surgical guillotine method, as it is largely practised, should still be almost universal. The method practised at Great Ormond Street is that first described by Mr. George E. Waugh. This method is described at the end of this article.

One further point must be mentioned in connexion with the treatment of chronic discharge from the ear. If despite treatment the discharge continues, it is often a sign that the mastoid cells are already infected and the only means of clearing the condition is by exploring the mastoid cells and clearing out all infected bone. Sometimes even in the fairly acute cases the rate of discharge is such that it could not be caused by involvement of the middle ear alone. When the small size of this cavity is remembered it becomes evident that in these cases the pus must be formed outside the cavity—in the mastoid cells—drain thence to the tympanic cavity and so to the exterior. In these circumstances it is generally necessary to obtain efficient drainage by the mastoid route. Those chronic cases which fail to clear up despite usual treatment will often give dramatic results after zinc ionization.

Infection of the Mastoid Antrum.

Most cases of mastoiditis will be found as an extension of middle ear disease.

At birth the mastoid process of the petrous bone is absent. No air cells are present at this period excepting the antrum. In the infant the antrum is practically on the surface, being separated by only a very thin flake of bone. This recedes at the rate of about one millimetre for each year of life up to the age of puberty. The cavity is lined by mucous membrane continuous with that of the tympanic cavity, these two compartments communicating by way of the *aditus*. Usually the pus which collects in the antrum, passes to the tympanic cavity thence through the perforated drum to the external auditory meatus. Failing this path, it will tend to follow one or other of the following routes and it must not be forgotten that meningitis is a possible complication of such spread:

1. It may eat its way through the mastoid to the surface and form an abscess behind the ear.
2. It may spread inwards to the internal ear.
3. It may extend cranialwards through the *tegmen* and give rise to a cerebral abscess.

4. It may pass posteriorly to the posterior fossa and give rise to a cerebellar abscess.

5. It may pass down through the inferior surface to the digastric fossa with a resulting Bezold's abscess.

Course of the Disease.

Often the child is brought up with the history that suddenly a preexisting aural discharge ceased. Soon afterwards a swelling was noticed behind the affected ear and the child has been crying with pain and has been feverish. On examination the auricle will usually be found typically displaced forwards and downwards. The mastoid process will be found tender and usually œdematous.

I would here call attention to a sign of the utmost value, but rarely mentioned and that is tenderness to percussion. Pain is caused by even the lightest percussion by the finger. With such conditions as furunculosis of the auditory meatue or with infected mastoid glands, œdema and tenderness to pressure will nearly always be found. Light percussion in these cases fails to elicit a tenderness. This tenderness to percussion is a certain sign of osteitis of the mastoid area. The temperature is found raised and the child somewhat restless.

Treatment.

When the diagnosis has been made, operation should be resorted to. In the prepurulent stage hot applications may abort the process.

Details of operation need not be here discussed save to state that I find the simple mastoid operation of Schwartz to suffice. The condition is one of acute osteitis and as such it must be treated. As a routine, when there is much infected bone, the *dura mater* of the middle fossa and that of the lateral sinus are exposed. No harm is thus done and it will save the overlooking of an infection of these parts. All carious bone is curetted away and jagged edges rounded off. There must be no "hammer and chisel" action, as hand gouges and bone nibbling forceps can do the work equally efficiently and with less damage to the patient. The middle ear with its contents is left severely alone, with the result that the facial nerve and hearing are not damaged. Care must be taken during the approach to the antrum, as in some cases the middle fossa and the lateral sinus are so far forward that only a very small amount of room is available between them and the ear.

As regards after treatment the daily plugging of the cavity as often done need not be carried out. This is very painful and each day dreaded by the child. Immediately after operation the wound is packed with gauze soaked in an emulsion of "Flavine" and paraffin as follows:

"Acriflavine"	0·1	cubic centimetre
Liquid paraffin	76	cubic centimetres
White wax	4	grammes
Water	20	cubic centimetres

The skin wound is not sutured at all. I have seen no gain by doing so and have seen several "accidents" by attempting this hastening of healing. No badly infected bone cavity should be sutured. After twenty-four to forty-eight hours the above plug can be painlessly removed. Each day the cavity is syringed out (twice daily if necessary) with 0·5% "Flavine" solution. No plug is reinserted into the wound, but this is protected by means of a wire cage, shown in the accompanying figure, of about 1·25 to 2·5 centimetres (half to one inch) mesh held in place by a strap round the forehead so that really the wound is left open to the air. Healing occupies about six to eight weeks.

In conclusion I would again draw attention to the question of cause of the disease and treatment thereof. In all cases tonsils and adenoids are removed. The latter may be curetted at the time of the mastoid operation and the tonsils enucleated about ten days to two weeks later.

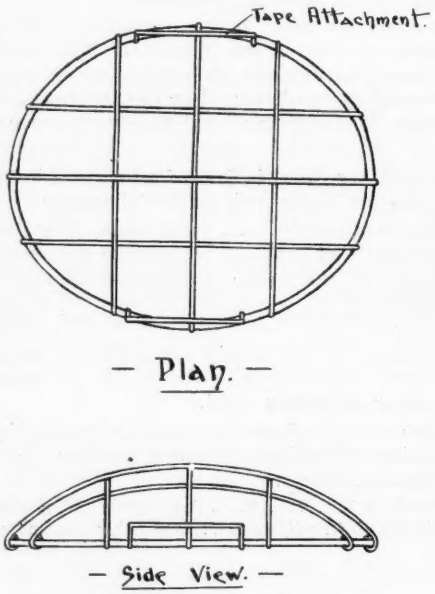

Figure Showing Sketch of Mastoid Cage.

The Operation of Tonsillectomy.

Mr. Waugh's operation for enucleation of tonsils may be described as follows.

The following instruments are required:

1. An efficient mouth gag. Waugh's gag I think the most suitable. This is made in two sizes and each size in two patterns, one with spikes for edentulous patients. I prefer this gag to the Davis gag.

2. A pair of tongue forceps which after the pattern of towel clips will pierce the tongue. A silk suture will answer the purpose.

3. Some form of tonsil-holding forceps such as Hartmann's conchotome. I think that Browne's tonsil holding forceps are better. These were designed by Mr. Denis Browne, Resident Medical Superintendent of the Hospital for Sick Children, Great Ormond Street.

4. Waugh's tonsil dissecting forceps. These are fine rat-toothed forceps (two in one) some twenty centimetres (eight inches) in length.

All the instruments mentioned may be obtained from Allen and Hanburys Limited.

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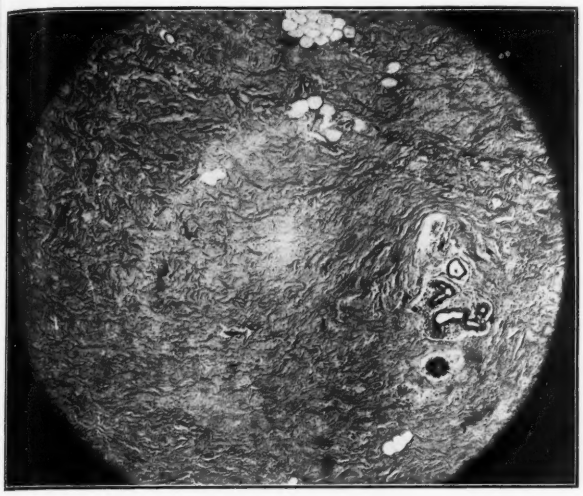

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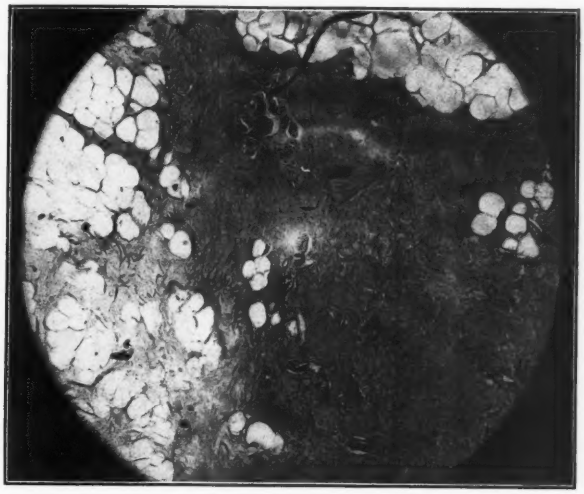

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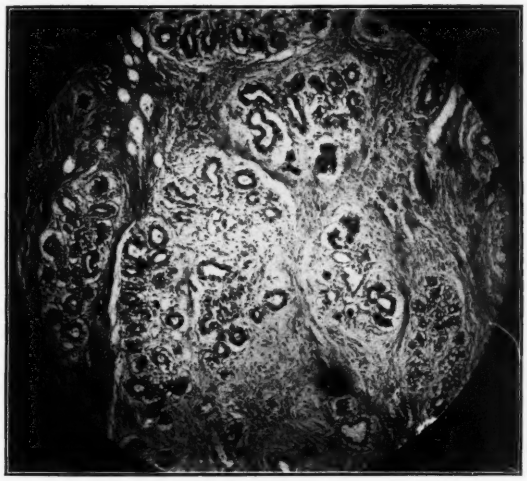

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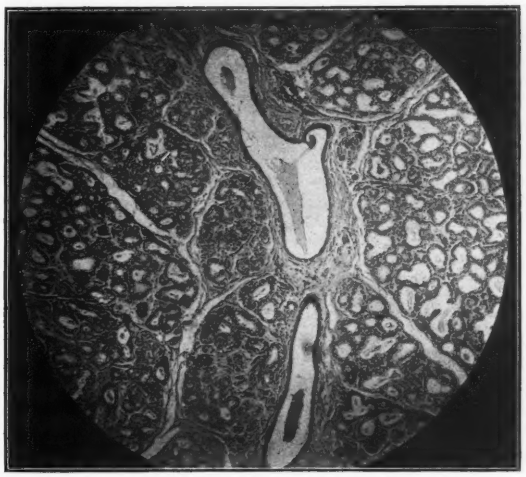

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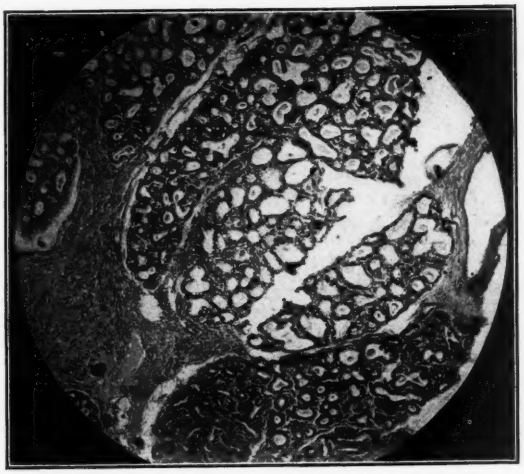

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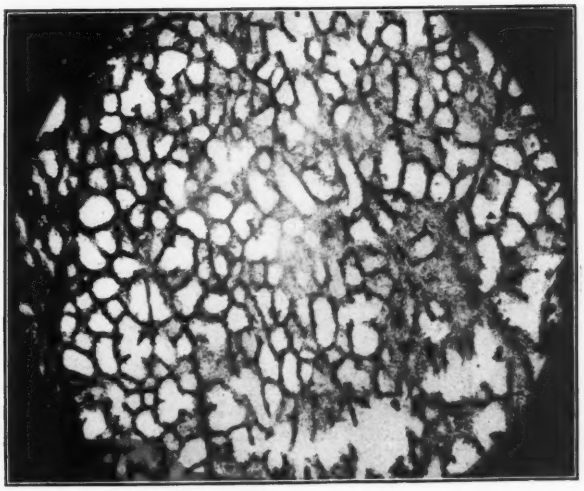

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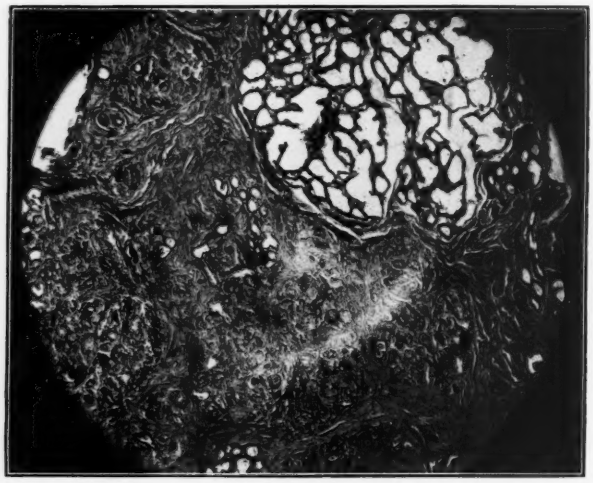

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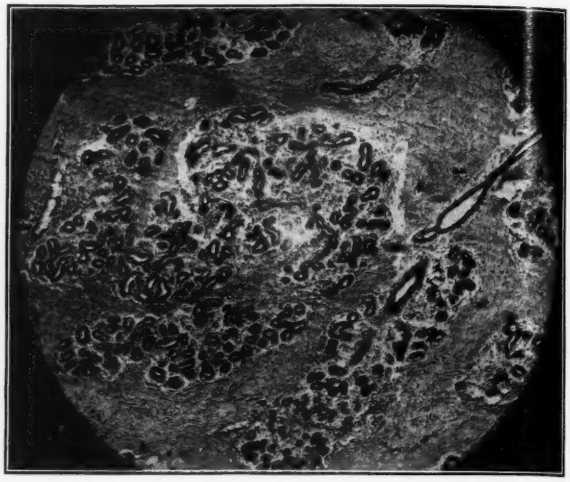

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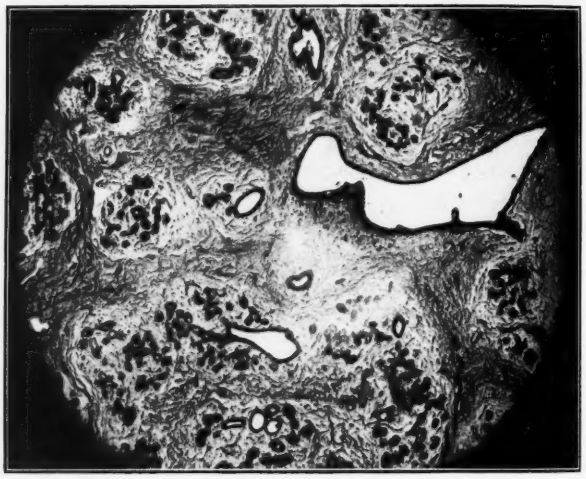

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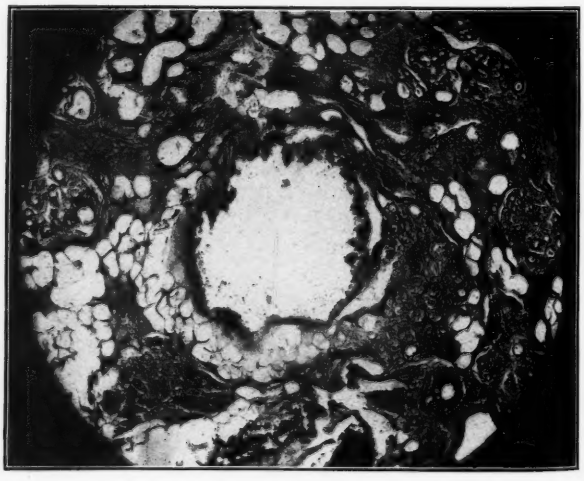

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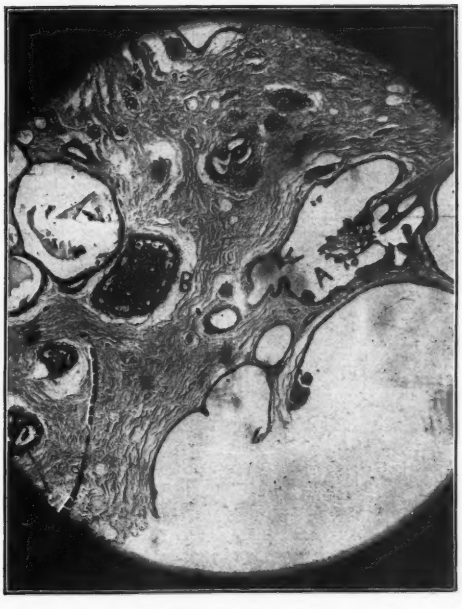

FIGURE XVII.

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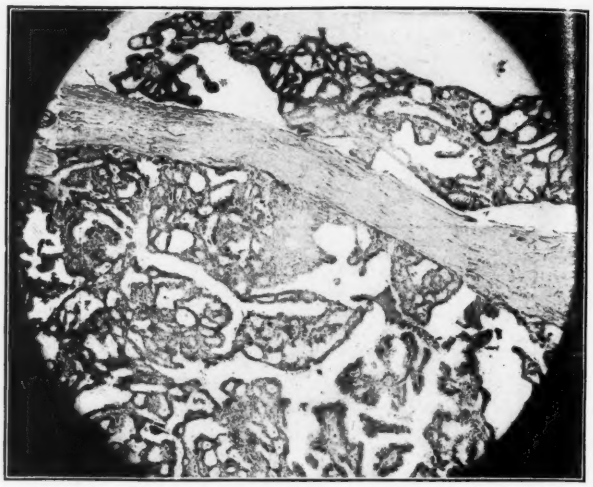

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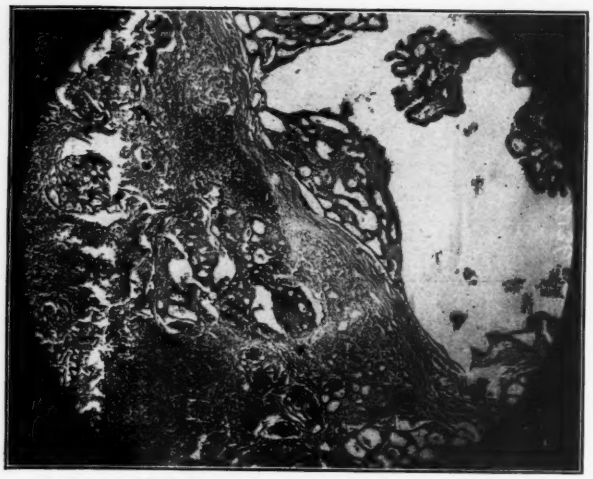

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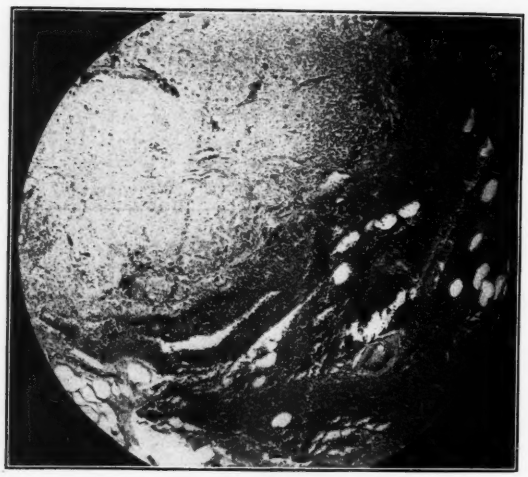

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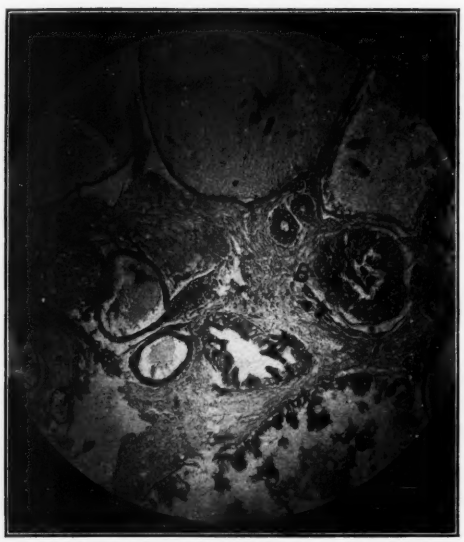

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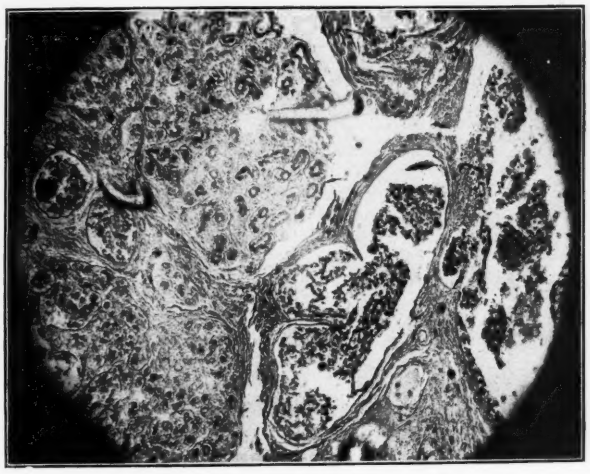

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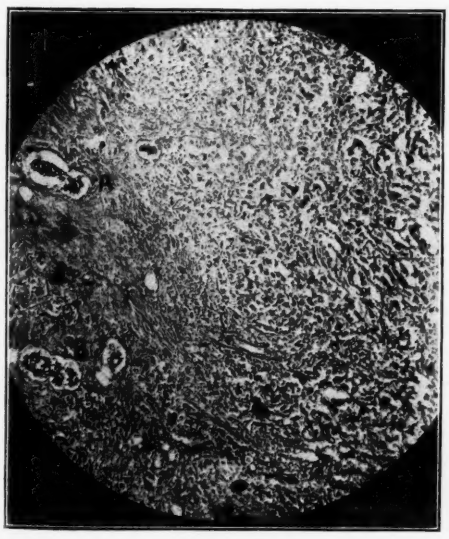

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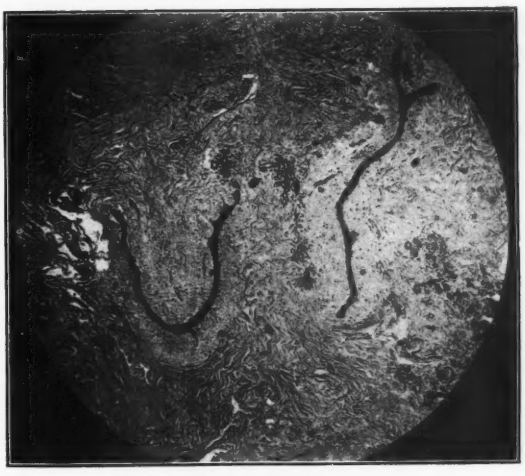

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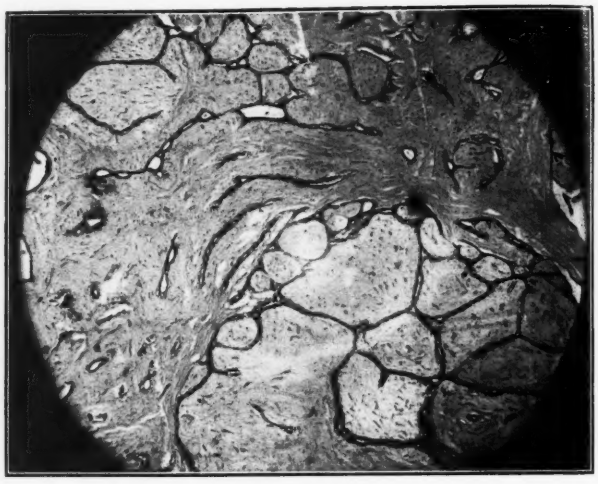
FIGURE XXX.



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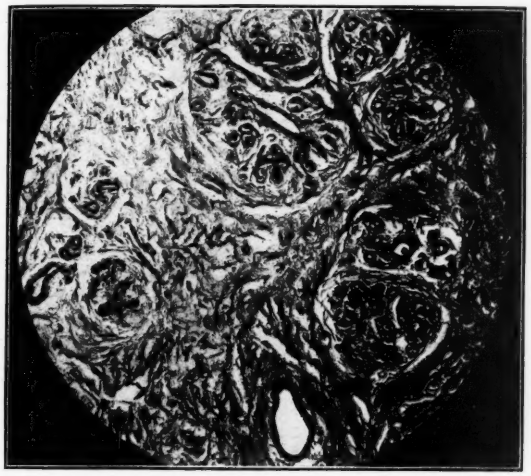

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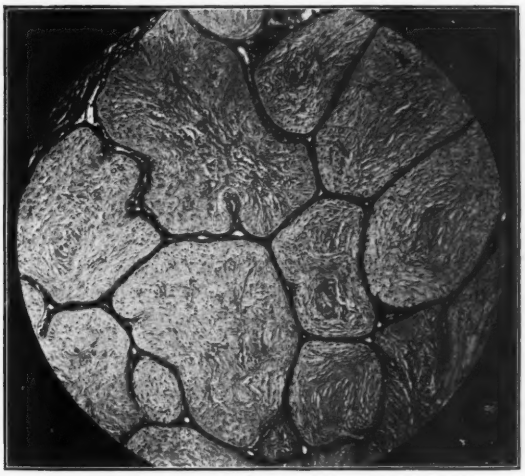

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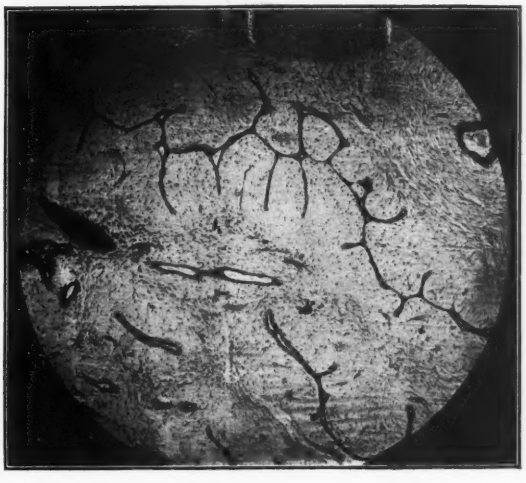


FIGURE XL.

ILLUSTRATIONS TO THE ARTICLE BY DR. A. J. TRINCA.

FIGURE XLI.

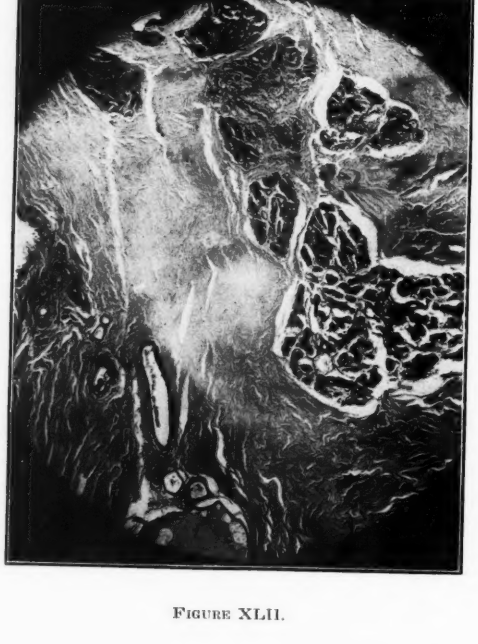


FIGURE XLII.

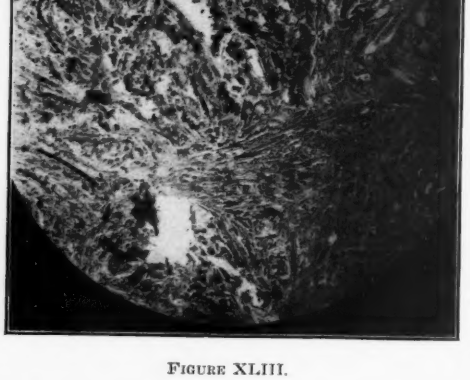


FIGURE XLIII.

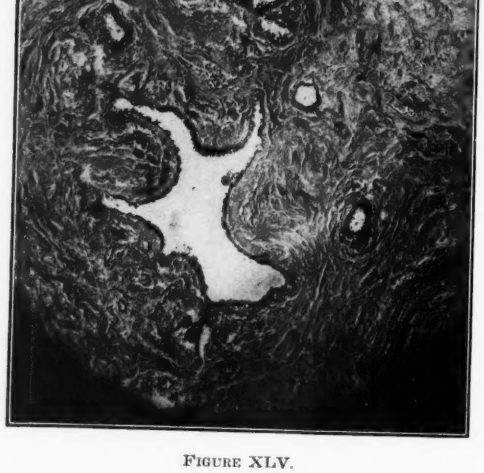


FIGURE XLV.

The Operation.

The patient is anæsthetized with ether after a preliminary injection of atropine until the stage is reached when the cough reflex is absent.

A small sand bag is placed under the shoulders so as to produce a hyperextension of the head. From a Shipway apparatus, or some such arrangement the administration of the anæsthetic is now continued through a bent tube which rests in the mouth at the angle. Unless the patient is sufficiently anæsthetized this "blast" of ether will not be tolerated.

The anæsthetist now sits at the head of the table. The surgeon stands at the right side of the patient for the removal of the left tonsil and *vice versa*. His assistant stands on the opposite side and controls the tongue and chin with one hand while with his other hand he steadies the head. He has no other duties. In the removal of the left tonsil the holding forceps are taken in the left hand, while the dissecting forceps are used with the right hand. The mouth gag is inserted and opened as widely as possible. A complete view of the fauces is now obtained. With certain patients of the "bull-neck" type there is a little difficulty in obtaining a good view.

The tonsil is now seized in the holding forceps and only light traction is made. The grip of this must be in front of the pillars of the fauces. With the dissecting forceps in the right hand, the surgeon takes hold of the mucous membrane immediately in front of the anterior pillar. By a movement of separating the two instruments—the holding forceps medially and the dissecting forceps laterally—this mucous membrane is torn through and the glistening capsule of the tonsil is now seen. This capsule must not be lost sight of during the remainder of the operation. The tear thus made is continued up towards the upper pole and down towards the tongue. A new hold is taken by the holding forceps and this time so that the capsule is included in the bite. Quite a fair tension can now be exerted without fear of the tonsil tearing. A small piece of gauze, folded up beforehand, is seized with the dissecting forceps and the tissues "wiped away" from the capsule. This blunt dissection is continued and the gauze gradually packed in between the tonsil and its bed. Hæmorrhage is thus controlled and the anæsthetist has no anxious moments. The posterior pillar is similarly freed completely down to the base of the tongue. During this procedure the grip of the holding forceps is being constantly changed, a gradual movement being made toward the tongue. The firmest attachment will usually be found at the lingual end. This is all removed by "tearing" with the dissecting forceps and not by means of snare or scissors.

By now the tonsil is removed and the fossa tightly packed with gauze which was put in during the blunt dissection. The surgeon now changes his position to the opposite side of the table and the two pairs of forceps change hands. A similar procedure is carried out and by the time the second tonsil is removed, the gauze may be removed from the fossa of the first when bleeding will usually be found to have ceased. The surgeon then seats himself at the head of the table and examines both fossæ. Bleeding can usually be controlled by gauze pressure. Failing that, any visible bleeding point can be easily secured and ligated. Some prefer in all cases to suture the two pillars together by means of cat gut. This is best carried out with a small, curved, round-bodied needle and any suitable needle holder. This causes less damage to the pillars than the usual instrument used. On the extent of damage to the pillars, I think, depends the after pain.

At this stage the administration of the anæsthetic may be stopped and the surgeon proceeds to remove the adenoids. When these have been curetted, bleeding is stopped by gauze. A final digital examination is advisable, firstly to feel that all the adenoid tissue has been removed and secondly to make sure that a gauze plug has not been left behind.

If this latter should occur, the patient will develope a profuse evil-smelling nasal discharge a few days after the operation. At the completion of the operation the surgeon should be absolutely certain that no tonsillar tissue remains and that all bleeding has ceased. He can then leave without the fear of being called to arrest hæmorrhage. Unless a good light is obtainable, much help can be given by a small throat lamp and dry battery.

The two most essential points are, I think, first, a good anæsthetist who is accustomed to the operation, and secondly, a good light. Everything else is perfectly straight forward.

The anæsthetic must allow the work to be done with the pillars at rest. With a little experience and good conditions the operation should not occupy more than fifteen minutes. The time is usually taken up in making certain all hæmorrhage has ceased rather than the actual removal of the tonsils.

Once the method has been mastered, the guillotine will not be used again.

COMPARATIVE STATISTICS IN REGARD TO MATERNAL MORTALITY.

By E. SYDNEY MORRIS, M.D., Ch.M., D.P.H. (Sydney),
Director of Maternal and Baby Welfare, Department of Public Health, New South Wales.

FROM time to time comment is made in the daily press concerning the maternal mortality rate of Australia in general and of New South Wales in particular. The comment is usually unfavourable and is frequently based upon a comparison between the rate of this State and that of England and Wales.

The comparison of the statistics of one country with another is subject to many pitfalls, unless we know accurately the respective methods of classification and the fine points of distinction which necessarily arise in differentiating between associated causes of death.

Theoretically all countries which have adopted the International Classification List, should have strictly comparable vital statistics. In actual practice this is not so owing apparently to varying individual judgement on the part of the statistical authorities concerned. It is well known that in several European countries, for example, France, Holland and Spain, the infant mortality rate, though presumably compiled in accordance with the International List, is not comparable with the rate of either England and Wales or Australia. In those countries the annual statistics not only exclude still-births, but also the births of children who, although born alive, did not survive beyond a certain period. This period varies with the different countries—three days in France and Holland, twenty-four hours in Spain. In our statistics these live births would be registered, would swell our first month mortality and thus vitiate any comparison between our statistics and those of the countries above mentioned. It is probable that special inquiry would show similar differences of classification regarding maternal deaths so that all international comparisons must be made with caution.

There are three aspects of the maternal mortality statistics of New South Wales which must be borne in mind in drawing conclusions therefrom.

First, New South Wales, so far as I can ascertain, is unique in its being so honest as to overload its

maternal mortality statistics with deaths arising from illegal operations. These deaths are recorded after coronial inquiry and, though classified under a special heading, are included in the total maternal mortality rate. In the Year Book no comment is made regarding this classification, nor as to its inclusion in the total maternal mortality rate, so that the average person accepts the rate as beyond question and in accordance with established custom.

From discussion with the Government Statistician's Department I have concluded that elsewhere these deaths are classified under homicide and as a matter of fact that classification is the correct one in accordance with the International Classification of Causes of Death. To this extent New South Wales statistics are overloaded and are strictly incomparable with the statistics of other States or countries.

Since all countries in the world follow more or less the International Classification it may be readily seen that New South Wales statistics make a comparison to our disadvantage. This also partly explains the fact that the maternal mortality rate, published by the Commonwealth Statistician for the State of New South Wales, is usually, if not always, lower than the rate published by the New South Wales Government Statistician. The number of deaths in New South Wales from illegal operations recorded after coronial inquiry during the last three years, for which statistics are available, is as follows: 1924, 32; 1925, 40; 1926, 40. These deaths constitute from 8% to 10% of our maternal mortality. In this connexion I should like to quote the report of the Medical Superintendent, Coast Hospital, regarding the cases of abortion.

> Abortion.—During the year (1925) 497 patients were treated for abortion. The admissions for this condition have increased of late years at a startling rate, as indicated by the following figures, which show the ratio of abortion cases to all cases treated in successive years 1919-1925 inclusive:

Year.	Total Patients Treated.	Abortions.	Percentage.
1919	5,941	54	0·91
1920	6,313	193	3·06
1921	6,952	237	3·41
1922	7,339	354	4·82
1923	8,769	381	4·34
1924	8,667	436	5·03
1925	8,935	497	5·56
1926	10,754	620	5·76

> I think it may be taken for granted that in the great majority of these cases, if not in all, the abortion had been artificially produced. The patients were sent to hospital on account of a rise of temperature which raised alarm of sepsis. Of the 497 under treatment in 1925, seven died from this cause; the others recovered. The situation has thus been created that the hospital acts as an accessory or cover to the abortionist by admitting and curing any of his victims who show signs of going wrong after the operation. This is certainly an improper rôle to be forced on a Government institution, but so far no remedy has been found. Meanwhile the practice of abortion must be increasing enormously in the metropolis, as the patients who seek admission to hospital are probably only a small proportion of those on whom the criminal operation is performed.

It can readily be imagined that in a large city, such as Sydney, a great many illegal operations occur which never come under notice. Considering that more than six hundred cases of abortion were treated in 1926 in the Coast Hospital, it stands to reason that a far greater number must occur throughout the whole State. Undoubtedly a large percentage of these is due to unnatural interference.

If the patients definitely ascertained to have died from illegal operations are excluded from our statistics the puerperal death rate is proportionately decreased, as can be seen from Table I.

TABLE I.—SHOWING PUERPERAL DEATHS AND DEATH-RATE IN NEW SOUTH WALES, EXCLUDING ILLEGAL OPERATIONS.

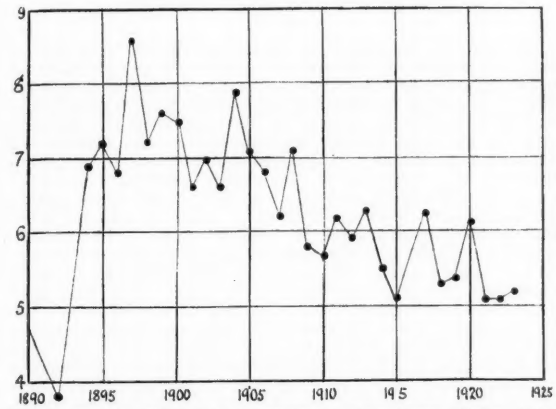
Year.	Total Maternal Deaths, excluding Illegal Operations.	Present Maternal Mortality Rate, including Illegal Operations.	Correct Rate, excluding Illegal Operations.
1924 ..	259	5·4	4·8
1925 ..	285	6·0	5·2
1926 ..	236	5·2	4·4

Secondly, in compiling New South Wales statistics special investigation and inquiry is made by the Government Statistician into the actual cause of death of a female of child-bearing age when the certified cause lends any colour to the possibility that the actual cause of death may have been associated with pregnancy or childbirth. The cumulative effect of such investigation which has been in continuous operation since 1893, must have not only produced greater accuracy in classification, but also have tended to increase materially the maternal mortality rate of New South Wales.

So far as I am aware, New South Wales is the only State of the Commonwealth in which such inquiry is made, and on that account its statistical mortality is probably more accurate and to that extent penalized in any comparison.

The accompanying graph, submitted by Professor J. C. Windeyer to the Royal Commission on Health, shows very clearly the definite increase in statistical mortality which followed the institution of this method of inquiry. The relationship of course may not be that of cause and effect, but it is extremely significant and in the absence of other explanation it is justifiable to conclude that the two facts are very closely associated.

Thirdly, the statistics of England and Wales were compiled prior to 1911 on a different basis to that of the International Classification of Causes of Death. From 1911 the International Classification was adopted, but in addition the original classification of maternal mortality was also continued in order to allow comparison with statistics compiled prior to 1911. In consequence the Registrar-General (England and Wales) publishes two allied tables; one dealing with maternal mortality on the basis of classification in use before 1911, the



Graph, Showing Maternal Mortality in New South Wales, 1890 to 1923. During the year 1893 the Government Statistician commenced to write to the medical attendant for further details in cases where there was any suspicion that the death was associated with the puerperal state.

other on the basis of classification from 1911 onwards. In the classification prior to 1911 deaths from puerperal nephritis and albuminuria were not classed as "direct" causes of maternal mortality, but as "associated" (non-puerperal) causes. This classification has been maintained and in almost every instance is quoted, even in publications of the Ministry of Health. The average person, not knowing of the difference in classification prior to 1911, quotes these statistics which are strictly incomparable with our own.

Further, the Registrar-General distinguishes between "total puerperal mortality" and "total maternal mortality" since the deaths from puerperal nephritis and albuminuria are placed under a special heading of "non-puerperal causes." This can be seen from Table II.

TABLE II.—CLASSIFICATION IN ENGLAND AND WALES PRIOR TO 1911, SHOWING RATES PER THOUSAND BIRTHS.

Year.	Puerperal Sepsis.	Other Puerperal Causes.	Total Puerperal Mortality.	Non-Puerperal Causes.	Total Maternal Mortality.
1921	1·46	2·25	3·71	1·29	5·00
1922	1·46	2·12	3·58	1·58	5·16
1923	1·38	2·22	3·60	1·22	4·82
1924	1·48	2·22	3·70	1·36	5·06
1925	1·62	2·24	3·86	1·29	5·15
1926	1·66	2·21	3·87	1·27	5·14

Rarely, if ever, is the total maternal mortality rate quoted, but practically always the average critic utilizes the "total puerperal mortality rate" which favours England to our disadvantage. If the New South Wales Statistics were drawn up on the same plan the rates would be as shown in Table III.

TABLE III.—SHOWING TOTAL PUERPERAL MORTALITY RATES OF NEW SOUTH WALES AND ENGLAND.

Year	New South Wales.	England.
1924	3·6	3·7
1925	3·9	3·8
1926	3·3	3·8

The comparison will now be seen to be to our advantage and I do not think that the above-mentioned anomaly is usually recognized. I have discussed this anomaly with the Government Statistician's Department and it seems that it has not been recognized previously by that Department.

There are probably many other features which make a comparison between Australian and English statistics somewhat difficult. In 1925 the Registrar-General (England) records 759 "deaths of women not classed to pregnancy and child-bearing, but returned as associated therewith." These deaths included, *inter alia*, tuberculosis, heart disease, embolism and thrombosis, pneumonia, chronic nephritis *et cetera*. It will be seen that very fine discrimination based on medical knowledge is required to determine whether such deaths should or should not be classified as maternal deaths. It is probable that the English classification of these deaths is quite accurate, but it is still more probable that our statistics would classify them as maternal deaths, since Australian Statistical Departments do not possess medical statisticians. To that extent our statistical mortality will be overloaded and therefore incomparable with those of England and Wales.

Reviews.

TREATMENT IN PÆDIATRICS.

IT is becoming more and more the fashion to separate diagnosis, prognosis and treatment in medical writings, so that a book entirely devoted to treatment is no curiosity. In the realm of diseases of children alone there are many examples and Greenwald's translation of Kleinschmidt's work is an interesting addition.[1]

The book has been rendered into fluent American with the translator's criticisms and additions in small print where necessary—a very helpful addition. The book has attained a fifth edition in Germany, but it does not follow that the English edition will be equally successful. In the first place, although the translation is not very obvious, yet the whole book is written in a dull and lifeless fashion which makes reading not very easy. The subject matter is on the whole excellent—it presents in short, dogmatic paragraphs one definite method of treatment.

The student or practitioner who picks the book up, will find an immense amount of information, most of which no doubt he knew before, but a large proportion he will find quite novel and suggestive. One feature which will lessen its usefulness for British students is the fact that many of the drugs and preparations recommended are German proprietary articles with apparently no British equivalents. In Germany, too, much work done elsewhere seems to be ignored, an action faithfully reflected in this book. The chapter on diabetes is a case in point. It is doubtful whether Van Noorden's egg and oatmeal methods are now of anything but historical interest, but the author solemnly digs up the details for his readers. The translator has to break in here and fill some three pages in an attempt to compress the treatment of diabetes

[1] "Treatment of Disease in Infants and Children," by Hans Kleinschmidt, M.D.; Authorized Translation of the Fifth German Edition, with Additions by Harry M. Greenwald, M.D.; 1928. Philadelphia: P. Blakiston's Son and Company. Demy 8vo., pp. 359. Price: $5.00 net.

into this short space. Nowhere is given what may be looked on as the fundamental basis of diabetic treatment in childhood. "The child requires so much food for growth and daily work. If that amount can be taken without glycosuria or hyperglycæmia well and good; if not, sufficient 'Insulin' must be given to make this possible."

The treatment of acute infectious disease is well done on the whole, but even the translator is shocked at the doses of diphtheria antitoxin recommended and advocates quantities much more in keeping with Australian ideas. He also mentions the valuable results obtained from the use of serum from convalescent patients in measles, either to confer a complete though temporary passive immunity or a partial immunity in which the course of the disease is very favourably modified. After such a modified attack the usual permanent active immunity persists.

The chapters on tuberculosis are disappointing.

In any such book as this some of the most important chapters are those on nutritional disturbances. It is almost unnecessary to state that the classification of Czerny and Finkelstein is faithfully followed and their feeding methods adopted.

The arrangement adopted is a cumbersome one. For instance dysentery is separated from other gastro-intestinal diseases and placed among the infectious diseases; whereas, as so many practitioners have learned to their cost, even comparatively mild diarrhœal conditions may be intensely infectious. The deficiency diseases, too, are broken up and for some not obvious reason rickets is placed among diseases of metabolism.

The feeding methods are most carefully chosen to fit particular types of disease and the only criticism is that in this country at least the clinical picture is seldom a sharp one. The author very properly stresses the value of the "malt soup" and farina (ground rice) preparations as yet too little used in this country, and speaks constantly of butter milk, almost an impossibility in an Australian summer, though its place can be taken by acidified skimmed (dried or "separated" fresh) milk. "Protein" milk is, of course, frequently commended, but neither author nor translator mentions the very successful acidified milk and syrup introduced by Marriott, except in the chapters on formulæ and recipes.

A chapter on the feeding of the abnormal infant is well done, although there is nothing especially new, yet the matter is set out plainly and simply; the whole bears the obvious mark of being written by one having extensive personal experience.

There is a well written chapter on treatment of diseases of the nervous system; the attention paid to functional disturbances, "the nervous child," is especially valuable, though the section on enuresis contains little new. Asthma, much to the translator's difficulty, is included in this section; in fact there is no separate section, as would be expected, for the allergies of childhood—asthma, hay fever, eczema and food intolerance.

The section on vulvo-vaginitis is superficial and the author ignores the fact that for really adequate local treatment a general anæsthetic is needed.

The chapter on pyelitis is very disappointing; antiseptics, acids and alkalis alone are mentioned as of value. Vaccines are condemned, but small frequent injections of whole blood are advised to increase the infant's resistance.

The translator is more communicative. He discusses other methods of treatment and advocates (apparently not from personal experience) "Hexyl resorcinal," the value of which is still much debated.

Cœliac disease, another of the problems of infancy, is placed among the diseases of the nervous system as intestinal infantilism; the treatment does not read helpfully, but the translator comes to the rescue with a very sound page of advice.

Erythrœdema, one of the most difficult of all diseases of infancy to treat, is not even mentioned.

The remaining chapters deal with routine matters in a very straightforward and simple fashion.

Two chapters of formulæ and recipes conclude an interesting and valuable, but uneven, book.

NEUROLOGICAL EXAMINATION.

THE correct diagnosis of diseases of the nervous system calls for searching examination and such examination in itself requires familiarity with many ways and means as well as capacity to interpret what these may reveal. Most writers of textbooks on nervous diseases insert the skeleton of such an examination, but practically none clothes the skeleton with details of the needful procedures and explanations of the disclosures. It is this clothing which Dr. Core attempts to provide in his book, "The Examination of the Central Nervous System."[1] One by one he takes the different methods for eliciting disturbance of the constituents of the nervous system, he describes the proper way to apply each and he gives deductions as to what each may bring forth. This is his main task and in a useful summary chapter he tells step by step how to overhaul a patient from the time of stripping to stepping down. One the whole he does his work well, at the same time his writing is not free from slips; he obviously slips when he states that "delusions" instead of hallucinations "may be auditory, visual or olfactory," and again when he writes that a succession of deep breaths "produces a condition of apnœa," this in allusion to the augmentation of reflexes by hyperpnœa. In a manual written for students, as the preface indicates, slips of this kind should not occur.

A HANDBOOK ON OTO-RHINO-LARYNGOLOGY.

IN the fifth edition of Lamb's Diseases of the Throat, Nose and Ear, Mr. Frederick Sydenham is responsible for the work of revision, the author having retired from practice.[2] The reviser states that the book is not intended to be a textbook; it is rather a practical guide for the student and practitioner, enabling them to diagnose accurately and to treat such conditions as do not require the more experienced judgement of the specialist.

Such books have their special place and their special value; this value depends upon the personal factor. A textbook must be strictly orthodox and of necessity conservative, embodying the views of the many rather than those of individuals.

The volume under review, while far from being unorthodox or speculative, abounds in practical hints gleaned from a long experience in both general and specialized practice.

A thorough description of how to set about the examinations of the various organs dealt with, precedes each of the four main sections of the book. The morbid conditions likely to be met are then taken one by one, with their signs and symptoms. This is done thoroughly and so indeed is the succeeding account of treatment for all these conditions, despite the reviser's modest claim to "enable the practitioner to treat minor ailments."

Actual case records are freely quoted, an excellent feature in such a book, while the illustrations are numerous and excellent. Thirty-one plates illustrative of the radiography of sinuses accompany the section on this subject, a subject in which the author has incorporated many original observations. Among addenda is a useful account of zinc ionization and zinc electrolysis by Dr. A. R. Friel.

The printing is excellent and the English, while not of the highest standard, is in gratifying contrast to that found in American publications of this description.

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[1] "The Examination of the Central Nervous System," by Donald Core, M.D. (Manc.), F.R.C.P. (London); 1928. Edinburgh: E. and S. Livingstone, Crown 8vo., pp. 260. Price: 8s. 6d. net.

[2] "Practical Guide to Diseases of the Throat, Nose and Ear for Senior Students and Junior Practitioners," by William Lamb, M.D., C.M. (Edinburgh), M.R.C.P (London), Revised by Frederick W. Sydenham, M.D., C.M. (Edinburgh), F.R.C.S. (Edinburgh), D.P.H. (Victoria); Fifth Edition; 1927. London: Baillière, Tindall and Cox. Crown 8vo., pp. 466, with illustrations. Price: 12s. 6d. net.

The Medical Journal of Australia

SATURDAY, JUNE 16, 1928.

Physicians and Surgeons.

ACCORDING to the By-Laws of the College of Surgeons of Australasia a member of the medical profession desiring to become a fellow has to be nominated by three fellows of the College and to supply information concerning himself in the form of replies to questions prescribed for the purpose. He has to sign a pledge and to give an undertaking that all communications made in regard to his application shall be confidential and privileged. It is assumed from the objects of the College and from what has been published concerning this body that no one can hope to be elected a fellow unless he has equipped himself in a satisfactory manner and is able to produce evidence that he is a competent surgeon. The fellowship of the College of Surgeons of Australasia is not restricted to those who confine their practice exclusively to surgery, nor can it be contended that medical practitioners who have not been elected fellows, are necessarily incompetent as surgeons. The College has no power to grant a degree or diploma. It is a voluntary body and its disciplinary control does not extend beyond its members and fellows.

It may be stated further that every fellow of the College of Surgeons of Australasia is not necessarily an expert surgeon. Every care is taken to refuse admission to practitioners who have not undergone the training needed to render them competent operators. But inasmuch as the possession of the diploma of Fellow of the Royal College of Surgeons cannot be regarded as irrefutable evidence that the individual is a skilled operator or a sound physiologist, even the care exercised before election does not guarantee exceptional ability on the part of a fellow of the College of Surgeons of Australasia. In these circumstances the object of the College to cultivate and maintain the highest principles of surgical practice and ethics may be attained in the mass, but will probably not be achieved as far as every individual fellow is concerned. It is hoped that its influence and control will result in a material limiting of bad surgery and of commercialism in its practice.

While this journal has declared itself unreservedly in favour of the movement and is prepared to lend its support to the College in order to expedite its development, its advocacy cannot be extended beyond the confines of surgery. There seems to be a strong tendency on the part of undergraduates and some graduates to practise as surgeons. It has to be pointed out that the surgeon is not a physician and that if he devotes his energy to the treatment of disease by surgical means, he cannot lay claim to the possession of those attributes which constitute a true physician. Medicine demands just as much special training as and perhaps more intense study than surgery. Fellows of the College of Surgeons, if they desire to further the cause of their institution, should seek the aid of physicians whenever a patient's condition cannot be benefited by surgical means alone. The general practitioner has to cover the whole range of medicine and surgery, but if he is wise, he recognizes the impossibility of one individual being expert in all branches of this wide science. He therefore seeks the advice, guidance and help of a physician or surgeon when he encounters a difficult diagnosis and a condition that requires special skill in treatment. The skilled operator who relies on a smattering of knowledge and a limited experience, and who fails to obtain help and guidance from his physician colleague, is usually a very dangerous surgeon. His views are often influenced by his unbounded belief in the mechanical aspects of treatment. At times he fails to recognize that the operative treatment of a pathological affection can be sanctioned only when a satisfactory medical treatment has not been discovered. It is by no means infrequent that a surgeon's aid is needed for a condition that demands very skilled investigation by physicians, neurologists, biochemists, radiologists and bacteriologists. When a patient consults the surgeon and the latter neglects to summon the aid of his colleagues who have made a special study of other branches of medical science, grave harm is likely to result.

Physicians will insist on having their patients placed under the care of a fellow of the College of Surgeons when operative treatment is needed, but they will also insist on reciprocal recognition. If it is in the public interest that an association be formed to promote the practice of surgery, it is equally in the interests of the whole community that surgeons should not attempt to act as physicians, but should refer their patients to colleagues competent to carry out medical and allied investigations. If the public is to be informed that the fellows of the College of Surgeons are expert in their branch of medicine, there should be an equally frank announcement that almost every patient should be seen by a physician before he is submitted to operative treatment and that medicine is too big a science for one practitioner to be expert in both medicine and surgery.

The position of the general practitioner is scarcely affected by these considerations. In the cities and suburbs he calls in the physician or surgeon whenever he considers that it will be of benefit to his patient to have his opinion confirmed or corrected. In the country he meets his difficulties in an admirable manner. We trust that physicians in hospitals will demand that fellows of the College of Surgeons will not trespass beyond their own fields.

Current Comment.

THE MONOCYTES IN PNEUMONIA.

THE blood changes which occur in pneumonia, are recognized to be of importance from a diagnostic, but chiefly from a prognostic point of view. As a rule the number of leucocytes is increased and the increase may be regarded as an expression of the resistance of the patient to the toxins of the pneumococcus. The symptoms of the disease may be exceedingly severe and there may be no increase in the number of leucocytes; in fact there may be a leucopenia. In these circumstances the patient does not recover—the tissues have been so overwhelmed that there is no time for a reaction to take place. The leucocytosis generally makes its appearance soon after the initial rigor and a day or two before the occurrence of the crisis a slight diminution in the number of the cells may be noticed. The normal level is reached several days after the crisis. When the fall of temperature is by lysis, the reduction in the number of leucocytes may be more gradual. When the leucocytes are reduced in number at the time of the crisis, but fail to reach a normal level within three or four days, it can almost certainly be taken for granted that some complication, such as empyema or pericarditis, is about to make its appearance.

In 1927 R. A. Hickling found that in bronchopneumonia the monocytes in the circulating blood increased in the early stages of the disease to a point above normal and that later on the numbers again became normal. He has now carried out a series of observations in order to determine whether similar changes occur in patients with lobar pneumonia and by comparing the changing blood picture of the disease with the clinical course to determine whether any deductions can be drawn regarding the function of these cells.[1] He has made daily observations on the blood of twenty patients who suffered from lobar pneumonia. The total leucocyte counts were made and differential counts were made with an oil immersion lens. In the latter estimations five hundred successive cells were counted in more than half the cases studied. In the remainder one hundred cells were counted, but when the total leucocyte count was high, four or five hundred cells were counted in these cases also. The only method of selection adopted was that patients were used on whom the blood examination could be performed within three days of the onset of the disease. The results of the examinations are set out in a table. The first four patients died. Of the sixteen who recovered, all but three presented a blood picture at the beginning of the disease in which the monocytes were within or slightly above normal limits. In the other three the monocytes were slightly above normal at the beginning of the disease. In the first four cases (those which ended fatally) the leucocytic variations were similar. There was a polymorphonuclear leucocytosis and in two of the four instances the cells numbered over 24,000 per cubic millimetre. The lymphocytes of three patients were abnormally low in number and those of the fourth were present in about the normal numbers. The monocytes were low in all four and tended to fall lower towards the fatal termination. In the second group of thirteen "typical cases" more variation was noted, but the general picture was similar in all. A polymorphonuclear leucocytosis was present. In four patients this was not high, the maximum number of cells being 12,000 per cubic millimetre. The remaining patients had a leucocytosis of between 17,000 and 28,000 per cubic millimetre. In five of these instances the number of leucocytes fell to normal within twenty-four hours of the crisis, but in the others the fall was more gradual. Variations were found as far as the lymphocytes were concerned In seven instances they were abnormally low at the beginning of the observations, but were present in normal numbers in the other six. In all they rose later in the disease and in seven a definite post-infective lymphocytosis was noted. This lympho-

[1] *Archives of Internal Medicine*, November 15, 1927.

cytosis was only transient. At the beginning of the observations in these thirteen instances the monocytes were either within normal limits or slightly above the normal maximum. They rose in numbers in every instance and reached a point which was regarded as indicating a monocytosis. The highest point of the monocytosis varied in relation to the onset of the disease and the occurrence of the crisis. In nine instances the peak occurred after the crisis, in two it occurred just before the crisis and in one instance the temperature fell by lysis and the peak was noted on the ninth day. In the remaining instance a fall of temperature did not occur during the period of the observations and the monocytosis persisted; the patient's pneumonia was followed by empyema. The findings so far described cover seventeen of the twenty patients; there remain three patients who manifested a high monocyte count at the time that the first observations were made. In these three persons the total number of monocytes fell away gradually to within normal limits before the observations were ceased and there was also a high polymorphonuclear leucocytosis which fell gradually but irregularly to normal.

The first point to be considered in connexion with this work is the use of the term monocytosis. Hickling states that the smooth nature of the curves representing the monocytic variations indicates that it is the total number of the monocytes per cubic millimetre and not the percentage which is of importance. In the graphs which have been reproduced, the monocytic curves are distinctly different from those representing the polymorphonuclear cells. Here the monocytosis is relative and of undoubted significance. The term monocytosis is used frequently and Hickling uses it to denote the increased number of monocytes when the number stands in the same relation to the total number of leucocytes as it does to the latter when there is no leucocytosis. The use of the word monocytosis may lead to a wrong impression in that the existence of a general leucocytosis may be forgotten, for the significance of the monocytosis in these circumstances will be that of the general leucocytosis. In summarizing his results, Hickling refers to the "characteristic reaction of the monocytes" in the blood in pneumonia. He holds that the peak of the monocytosis generally occurs after the crisis and that subsequently the number of the monocytes returns gradually to a normal figure. If death occurs early in the disease, the number of monocytes is generally found to be low; when death occurs later, monocytosis may be present before death. The latter part of this statement is made as a result of blood counts made on twelve patients with pneumonia who were not in the series of twenty previously referred to. Apparently only one or two or at the most three examinations of the blood of these persons were made. Of the twelve six died. The number of monocytes per cubic millimetre and the total number of leucocytes per cubic millimetre in each of the six cases were respectively: 320 and 11,600, 450 and 22,400, 70 and 17,600, 80 and 2,600, 390 and 15,700, 490 and 16,500, 1,200 and 20,000. When the percentage number of monocytes to the total number of leucocytes is calculated the following approximate figures are obtained: 2·7%, 2·0%, 0·4%, 3·0%, 2·5%, 6·0%. Hickling states that in normal blood the monocytes comprise about from 2% to 6% of the total number of leucocytes. In each of the six patients, therefore, who died, there was a normal (in one instance less than normal) percentage of monocytes. There is nothing to show that in these persons the percentage of monocytes was any different at any stage of the disease. It is impossible to apply this method of calculation to the twenty patients in the first series, for the total number of leucocytes is not given. Some of the graphs, however, are produced and from these it is seen that in several instances there was a definite relative monocytosis. The peak of the monocyte curve was almost always different in point of time from that of the polymorphonuclear cell curve.

In regard to the significance of the monocytic variations Hickling concludes that they are an indication of the emigration of monocytes from the place of origin to the lungs to perform a function closely connected with resolution. He holds that the most certain evidence that resolution is taking place is obtained by watching variations in the shadow of the lungs with the fluoroscope. In six of the sixteen patients who recovered in the first series, the resolution was watched with the fluoroscope; in all a monocytosis appeared in the circulating blood at the time resolution was taking place, but the monocytosis did not last throughout resolution. In six others the monocytosis occurred at the time that ordinary clinical evidence indicated that resolution was commencing, but this was not confirmed with the fluoroscope. In the four other cases the evidence was not certain, as the patients were not followed closely enough. The *post mortem* findings in three cases are held to support in some measure the belief of a close association of monocytosis with resolution. In these three instances there was no monocytosis and no evidence of resolution was seen in the lungs. Hickling goes no further than this. The monocytes have been the subject of great discussion, both in regard to origin and their relationship to other blood cells. W. H. Lewis devoted a Harvey Lecture to them in 1925. He pointed out that mononuclear cells give rise to macrophages and also to epithelioid cells and giant cells. They are undoubtedly concerned in the defence of the body against infective agents. Hickling's work shows that in the present state of knowledge they may be regarded as "shock troops," called out to meet the pneumococci. There is no evidence to show that there is any specific antigenic relationship between the pneumococci and the monocytes. As a matter of fact Hickling's series of observations is so small that little more than general impressions can be drawn. The full tale of the monocytes has yet to be told and until their origin has been definitely determined their full function is not likely to be revealed.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

The Effect of Bacteriophage on the Phenomena of Leucocytosis and Phagocytosis.

A. R. NELSON (*Journal of Immunology*, January, 1928) has studied the effect of the administration of bacteriophage upon the leucocyte reaction and the effect of bacteriophage on the phagocytic power of the leucocytes and on the opsonic power of the serum. The strain of bacteriophage used was an antistaphylococcus bacteriophage in a filtrate of relatively low potency. Rabbits were the animals used in the experiments and all injections of bacteriophage, staphylococci or both were intravenous. The author summarizes the conclusions arrived at as a result of experiments carried out and states that the intravenous injection of antistaphylococcus bacteriophage exerts a definite influence on the type of leucocytic response elicited by susceptible staphylococci, but has only a slight effect upon the type of response due to resistant organisms. This influence is characterized by the fact that a single injection of the bacteriophage together with susceptible organisms causes a decrease in the degree and time of appearance of the leucocytosis as compared with that due to susceptible organisms alone. Repeated injections of the bacteriophage increase the period of leucopenia and decrease the degree of leucocytosis as compared with that due to susceptible organisms alone. The bacteriophage does not alter the type of response due to resistant organisms in any way comparable to the effect of the bacteriophage on the type of leucocytic response due to susceptible organisms. When the leucocytes and organisms are brought into contact with the antistaphylococcus bacteriophage *in vitro* either in the presence or absence of serum, the degree of phagocytosis in the case of susceptible organisms is definitely increased, whereas in the case of resistant staphylococci the degree of phagocytosis is practically unaffected. When antistaphylococcus bacteriophage is injected intravenously, there is an almost immediate increase in the phagocytic power of the leucocytes for susceptible organisms, whereas for resistant organisms the phagocytic power remains practically unaltered. The opsonic power is not altered appreciably in either case.

Complement Fixation with Bilharzia.

N. HAMILTON FAIRLEY (*Journal of Pathology and Bacteriology*, January, 1927) deals with the effect on antibody production of the injection of protein-free alcohol-soluble extract of the fresh livers of *Planorbis* infected with bilharzia cercariæ into living animals. Daily injections into the jugular vein of goats were made. In three out of four instances a definite and sustained serological response was obtained. It became evident during the second week and a maximum fixation of four and a half, five and six minimum hæmolytic doses of complement were obtained twenty-one to twenty-five days after the initial injection. An accentuated type of response ment was obtained twenty-one to infection with *Schistosomum spindalis* by subcutaneous injections of emetine. In three goats infected with *Schistosomum spindalis* intravenous injections produced an almost immediate increase in the circulating antibody. The author claims that the uniformity of the serological response obtained in these experiments proves that the extracts used function as true antigens. Both chemical and biological tests indicate an entire absence of admixed protein in the extracts. The extract may be used as provocative injections for diagnostic purposes when the available serological methods are inadequate. A decisive rise in antibody content of serum occurring within a few days of the first injection is pathognomonic of infection with *Schistosomum*.

The Experimental Transmission of Yellow Fever to Laboratory Animals.

ADRIAN STOKES, JOHANNES H. BAUER AND N. PAUL HUDSON (*American Journal of Tropical Medicine*, March, 1928) report the successful transmission of yellow fever to monkeys. In the early stages of the experimental work the species of monkey used was *Macacus sinicus* which was found to be susceptible to yellow fever only to a moderate degree. Of six monkeys inoculated with citrated blood from patients suffering with yellow fever, five developed a temperature of 40·5° C. (105° F.) or higher, followed by collapse and death, but the clinical manifestations of the infected monkeys were not striking and the *post mortem* findings were not in complete accordance with those noted in human beings who have died of yellow fever. In the later stages of the investigation *Macacus rhesus* was used and proved far more susceptible to infection. The animals were inoculated with citrated blood collected from human patients early in the disease and the strain of virus was carried from monkey to monkey by inoculation of blood and serum for several months. Approximately thirty monkeys were inoculated with fatal results in all but one instance. The transmission of the virus by mosquitoes (*Ædes ægypti*) was also successfully carried out. The mosquitoes, when once infected by feeding on monkeys suffering with yellow fever, were found to remain infective for the remainder of their lives, which in some instances exceeded three months. The bite of a single infected mosquito was sufficient to produce a fatal infection in a monkey. The possibility of the transmission of the virus through the egg of an infected mosquito was investigated. The infected mosquitoes after feeding on normal monkeys usually laid eggs after each feeding of blood. The eggs from several lots of mosquitoes, known to be infective, were collected for a period of over a month and adult mosquitoes from the eggs were secured. Over two hundred female mosquitoes thus collected were allowed to feed on a normal rhesus monkey, but no evidence of infection with yellow fever followed. The monkey was later proved to be susceptible, as it died with typical lesions of yellow fever after inoculation with 0·5 cubic centimetre of virulent blood. The virus of yellow fever was found to be filtrable when in the circulating blood of monkeys, but not when in the mosquito. The lesions found in *post mortem* examinations of infected monkeys were found to be similar macroscopically and microscopically to those found in human yellow fever. The clinical course of the disease in *Macacus rhesus* is also similar to that found in human beings. Attempts to cultivate the virus both from infective blood and from filtered emulsions of mosquitoes were unsuccessful. No microorganisms were found in the tissues of infected animals stained by Giemsa's and Levaditi's methods. Monkeys were protected against infection with the virus by 0·1 cubic centimetre of serum from a convalescent yellow fever patient, while two cubic centimetres of normal human serum failed to protect. Infection of chimpanzees, local African monkeys and guinea pigs was unsuccessful.

Meinicke's Test in the Diagnosis of Syphilitic Infections.

E. A. RUCKER AND L. E. H. WHITBY (*British Journal of Experimental Pathology*, February, 1928) recommend the use of Meinicke's test in the diagnosis of syphilitic infections on account of its simplicity, speed, small amount of serum required and ease with which a definite result can be obtained, but admit that the Wassermann test should invariably be carried out also in doubtful cases. The test is best performed with Meinicke's own extract, but the authors have succeeded in obtaining consistently good results with a reagent prepared by themselves. Full details of the preparation of the extract and of the performance of the test are given. When a given quantity of the reagent is mixed with a given quantity of a syphilitic serum, a turbidity occurs which is visible in one hour and maximal in two hours. No turbidity occurs with serum which yields no reaction, and the entire reaction with a reacting serum can be inhibited by the addition of one drop of 40% formaldehyde. Both macroreactions and microreactions may be tested. In a series of two hundred and fifty-four specimens of serum the results obtained with Meinicke's test were in complete agreement with the Wassermann test in 91%. In analysing these

findings it was noted that it was with serum from treated patients that agreement was not secured. The authors find the test less difficult to perform and more easy to read than either Kahn's test or the "sigma" test and particularly recommend the micro-reaction in testing serum from children with congenital syphilis on account of the small amount of serum required.

Vaccination of Guinea Pigs against Tuberculosis.

C. C. OKELL AND H. J. PARISH (*British Journal of Experimental Pathology*, February, 1928) report the results of experiments carried out during the last three years in an endeavour to repeat Professor Calmette's work on the prophylaxis of tuberculosis in guinea pigs with a living vaccine of Calmette and Guérin. In the experiments carried out groups of animals received one or more injections of the vaccine by the subcutaneous or intravenous routes; after five to twelve weeks the vaccinated animals and an equal number of control animals received an infecting dose of virulent tubercle bacilli. No lesions were produced by "Bilie-Calmette-Guérin" during the period of observation. In each experiment six or more vaccinated guinea pigs which had not received an injection of virulent organisms subsequently have remained well for several months and have shown no signs of tuberculosis when killed. Guinea pigs inoculated with "Bilie-Calmette-Guérin" and later with virulent tubercle bacilli have lived longer than others which received an infecting dose of tubercle bacilli only. It is not certain from the evidence produced in these experiments that "Bilie-Calmette-Guérin" is a better prophylactic than living attenuated tubercle bacilli, bacillary emulsion or dead tubercle bacilli.

HYGIENE.

The Pollution of Swimming Baths.

J. GRAHAM FORBES (*The Journal of State Medicine*, October, 1927) states that until the last three or four years the subject of bath sanitation took little prominence in England and, as regards London, it was not until 1925 that measures to remedy the pollution of swimming baths received serious attention. Care is now being taken to insure the cleanly condition of the public swimming bath both in London and the provinces. There is a number of instances on record of cases of conjunctivitis, sinusitis, *otitis media* and infectious sore throat, which have been attributed to the use of the swimming bath, and apparently with sufficient grounds for acceptance, in that the conditions developed within twenty-four hours of bathing in persons previously in good health. The question as to what direct evidence exists in proof of infection attributable to swimming bath pollution and of the risk incurred by bathers is one which obviously suggests itself as calling for definite answer. Quantitative and qualitative tests have shown the presence in bath water yielding a count of 4,000 per cubic centimetre of organisms derived from skin contamination, such as *Staphylococcus pyogenes aureus*; from normal saliva, such as *Streptococcus salivarius*; from fæcal contaminations, such as *Bacillus coli communis*. These organisms, though for the most part normal saprophytes of the human body, are yet capable under certain conditions of proving pathogenic, particularly when resistance is lowered by chill due to exposure and to staying too long in the water. The Bathing Committee of the American Public Health Association have recommended that certain bacteriological and chemical standards should be adopted as criteria of purity in the examination of samples of swimming bath waters. The cost of maintaining swimming bath water in a satisfactory condition is necessarily of the first importance. Where the expense of a complete filtration plant cannot be entertained, chlorination should provide an economical means of disinfection, but its purpose is not achieved unless the amount of chlorine is kept at a constant figure. Intermittent disinfection is of little or no value. In addition to the bactericidal effect of chlorination by the hypochlorites of lime and magnesia, there also results clarification through the solvent action of liberated chlorine on suspended organic matter and the action of copper sulphate in destroying and inhibiting algal growth. Both these are of great importance to increase and maintain the transparency of swimming bath water. Turbidity may be due to human or vegetable pollution or to larvæ and may so obscure objects at the bottom as to render them quite invisible. There have been cases of drowning in swimming baths in which owing to the state of the water it has been impossible to locate the body of the drowned person lying on the floor of the bath.

New Apparatus for Artificial Respiration.

C. K. DRINKER (*The Journal of Industrial Hygiene*, January, 1928) describes an apparatus for artificial respiration operating on a wholly new principle. This apparatus has been devised by Thunberg. Breathing is accomplished by bringing a certain volume of air into the lungs and then expelling it and all methods of artificial respiration, whether manual or instrumental, operate in the same volumetric manner. Invariably the thorax must expand and contract in order to accomplish the movement of a sufficient volume of air to meet the necessities of life. Thunberg, taking advantage of simple physical laws, proposes to substitute what may be called pressure breathing for the ordinary variety or volume breathing. He refers to an observation with a large air-tight, air-filled room A, containing a small open vessel, a glass flask B, which through its opening is in free communication with room A. If the pressure in A is rhythmically raised and lowered by means of an air pump, for each rise in pressure in A more air will move into B and when the pressure in A falls, air must flow out of B. It is observed that this ventilation of flask B is accomplished in spite of the fact that the volume of the flask is constant during the entire time. From this simple illustration it is apparent that it is possible to provide a good supply of air by pressure ventilation instead of by volume ventilation. Thunberg makes this more emphatic by showing that a small glass bell with a hole in the top may be substituted for the vessel B in the hypothetical illustration and the barospirator for room A. By rhythmic pressure changes in A, B is readily ventilated so as to keep the candle alight. The simplest type of barospirator consists of a boiler A, large enough to admit the body of a man. It is closed by a door. A tube leads to the cylinder B, in reality a large air compressor operated by an electric motor. A driving wheel is so arranged as to enable the stroke of the piston to be altered. The cylinder B is large and the pressure changes in A, resulting from the movements of the piston within it, are shown by a manometer. A valve, connected to A, is kept somewhat open, so that the air in A is always undergoing renewal. There is a still larger barospirator capable of holding a patient, a medical observer and a nurse. The respiratory needs of man are such as to require a renewal of about one-sixth of the lung air sixteen times a minute. In the barospirator this renewal is accomplished by a change in pressure and not in volume. The subject is locked in the chamber A and the motor started. The lungs and respiratory system of the patient now correspond to the glass flask in the first illustration. Ventilation is accomplished by rhythmic pressure differences between the air in the barospirator and the air in the respiratory passages. The situation is different from that presented by other methods of artificial respiration in that ventilation is attained without volume changes in the pulmonary air spaces. The lungs become an entirely passive part of the performance and the barospirator chamber the active part. The majority of persons placed in the barospirator soon lose all respiratory movements, as the setting of the instrument reaches a point meeting their respiratory needs. This apnœa is what must be expected if pressure changes instead of volume changes begin to meet respiratory requirements. It seems certain that the barospirator can offer no danger to the patient. Pressures outside and inside the lungs are equal almost instantly and even if the barospirator

is set to give unduly great changes in pressure, it is impossible to see how harm can be done. Up to the present time the apparatus has had its most extensive use with normal subjects. In a recent American experience a patient with Landry's palsy was kept alive for one hundred and eight hours by relays of men giving artificial respiration by the prone pressure method. Sleep is out of the question under such conditions and death from exhaustion must occur if spontaneous breathing is not resumed. The barospirator, in that it permits sleep and rest and provides respiration which is thoroughly adequate, offers the possibility of treating patients with respiratory failure heretofore unapproachable. Barospirators must always be rather cumbersome affairs and it is doubtful whether they can have field use to any satisfactory degree. But this is unnecessary. One such appliance in a centrally situated hospital would be sufficient for the relatively few patients who actually require such prolonged treatment. It is the usual instruction to advise the continuance of prone pressure artificial respiration for four hours, for example, in electric shock, gas poisoning and drowning. When it is evident that a long struggle is at hand, the patient can readily be brought to the barospirator without interruption of artificial respiration and treatment can then be carried on by the apparatus. Outside of Lund in Sweden such an opportunity is not as yet available, but the undoubted efficiency of the barospirator makes it certain that this apparatus will be installed in other places.

Tuberculosis as a Social Disease.

S. LYLE CUMMINS (*The Journal of State Medicine*, January, 1928) considers that tuberculosis may be said to take its general character from the type of social group in which it happens to prevail. Social variations are far too constant, far too universal throughout the world and throughout different strata of society to be explicable by any of the usual formulæ of "deficient diet," "faulty hygiene," "absence of sunlight" or "inherited predisposition." Diet factors, climatic factors and perhaps factors of heredity enter into the problem, but only as secondary influences which may temper or accentuate for individuals the operation of natural laws. For there are natural laws behind all these orderly variations in "social" tuberculosis, laws which are wider than tuberculosis and wider than human society itself, the laws of the adaptation of individuals or communities to their environment. What must be considered is the adaptation of man to his bacterial environment with special reference to the tubercle bacillus. It is obvious that while the adaptation is a function of the individual, the bacterial environment is provided by the community or, in other words, will vary with the density of human aggregation and with the percentage of infective persons in the social group. This will be admitted when it is realized that the human tubercle bacillus depends upon man for its survival and for its transmission to fresh hosts. If the results of animal experiments and of statistical inquiries and the bearing of these two orders of results upon each other are kept in view, the following postulates may be formulated, which may be called the laws of human adaptation to tuberculosis: (i) There can be no adaptation to tuberculosis without previous contact with the tubercle bacillus. (ii) Within certain limits the degree of adaptation to tuberculosis varies with the amount of previous contact with the tubercle bacillus or with the extent to which such previous contact has led to infective foci in the tissues. (iii) In persons successfully adapted to tuberculosis the presence of infective foci in the tissues is consistent with health; such persons are, on the one hand, relatively resistant to reinfection and, on the other, are liable to a progressive development of their pre-existing infection into chronic disease, if exposed to undue physiological or pathological stress or to massive "reinfection." (iv) Adaptation to tuberculosis through previous infection is calculated to modify the whole machinery of response to subsequent reinfection. (v) In persons unadapted or only slightly adapted to tuberculosis, exposure to massive infection is likely to result in acute, progressive and rapidly fatal disease. For these "laws" it may be claimed that they are supported by animal experiment, that they are in harmony with epidemiological findings, statistical and clinical and that they afford a definite basis for antituberculosis measures.

Changes in the Blood as Reflecting Industrial Damage.

SELMA MEYER (*The Journal of Industrial Hygiene*, February, 1928) states that it is of great importance in the chemical industry to concentrate on the damage to the blood and the blood-forming tissues which accompanies the absorption of blood poisons. The blood not only is the most sensitive indicator of internal processes, it not only takes a part and often a predominant part in the industrial damage experienced, but especially early—before the appearance of other readily appreciated changes—it is possible to become aware of generalized damage through recognition of variations in the cellular composition of the blood. In addition to the widely known blood changes in lead poisoning—polychromatophilia and basophilic stippling of the erythrocytes—there are other alterations which are of diagnostic and perhaps also of prognostic importance. This is especially true in regard to the blood picture in benzol poisoning. The author has had the opportunity of making blood examinations on workers in different industrial operations where exposure to benzol, toluol, xylol, naphthalene, nitro compounds, arsine, thallium, trichlorethylene and hydrocyanic acid was present. In reviewing the results of the blood examinations of these workers a certain reaction was found with the utmost regularity, namely, lymphocytosis with the reversal of the leucocyte formula to the lymphocytic side. Regardless of which poison is acting, the lymphocytes are invariably increased in the blood stream. The neutrophile cells are forced back or repressed. This identity of variation makes an identity of causation probable. There is a group of disease changes which possesses the same alteration of the leucocytic formula as the absolutely pathognomonic symptom—endocrine and sympathetic nervous system diseases. All diseases due to functional disturbances of the endocrine glands lead to an advance of the lymphocytes and a retreat of the neutrophilic cells. It may be conjectured, therefore, that these chemical poisons have an action on the endocrine glands. As a result of functional disturbances of the endocrine glands there is caused a reversal of the blood formula. This hypothesis requires the existence of other signs of endocrine disturbance which are unknown or which possibly have not been looked for or been connected with the symptomatology. It may be advanced from this angle that lately functional disorders of the endocrine glands have been brought into consideration as exogenous factors in the causation of pernicious anæmia. Attention has been called to the anomalous pigmentation in pernicious anæmia and this is regarded as a sign of endocrine hypofunction, a deficiency in the hormone from the adrenal cortex. This lack of an internal secretion should lead to an increase in functional activity of the reticulo-endothelial system which in its turn should result in an augmentation of blood formation. The connexion between these processes is so close that the degree of anæmia becomes directly proportional to the adrenal insufficiency. If a relation between endocrine glands and disease of the blood is at least conceivable, then damage to the endocrine glands as a means of causation of changes in the blood due to industrial conditions may be considered. A second conclusion of general type may be drawn from the findings in the blood, namely, that blood changes may be an early symptom, the only symptom and the permanent symptom of serious damage. Finally, from the diversity of the reaction to one and the same injury the significance of individual susceptibility not only for the degree but also for the type and character of the blood disease under observation may be appreciated.

The Inhalation, Retention and Exhalation of Dusts and Fumes.

P. DRINKER, R. M. THOMSON AND JANE L. FINN (*The Journal of Industrial Hygiene*, January, 1928) have carried out a series of experiments

to determine quantitatively the amounts of representative dusts and fumes retained and expired by man when known amounts are breathed. Human subjects were used in these experiments and suspensions were employed which simulated the finely divided dusts and fumes producing silicosis and lead and manganese poisoning, but which had not their dangerous qualities. Suspensions of freshly generated zinc oxide fumes (particles about 0·4 micron), of Kadox (a zinc oxide powder with particles about 0·15 micron) and of marble dust (particles about 0·3 to 6 microns) were set up in a 1,600 cubic foot gas cabinet. The subjects, seated outside the cabinet, inhaled the air from within and exhaled through an electric precipitator into a 125 litre spirometer. The total amounts of zinc oxide and of marble in the inhaled and exhaled air were estimated by means of the electric precipitator. Details of forty-one experiments are given in tables and graphs, showing the amounts inhaled, exhaled and retained by normal men and women. Various concentrations, lengths of exposure and rates of breathing were used. The percentage retentions for all three suspensions averaged 55 with a standard deviation of 9·4. The concentrations inhaled varied from about 50 to 450 milligrammes per cubic meter, the exposures from five to forty minutes and the rates of breathing from six to eighteen respirations per minute.

The Health of the Public School Boy.

L. R. LEMPRIÈRE (*The Journal of State Medicine*, February, 1928) describes his experiences as resident medical officer at a large public school in England for twenty-five years. He considers that the health of the school boy can be estimated by taking the physical measurements and by the less exact, but perhaps more useful, general impression gained by medical examination. In practically all schools weights and heights are taken at the beginning of a boy's career and subsequently at varying intervals. Mere records of weight and height are of little value, however, unless they are graded by some recognized standards. The grades used by the author are the result of 40,000 observations taken of school boys all over the country of the same social class. Each grade contains 5% of the whole number of boys of the same age. There are twenty such grades ranging from +10 (the best) to −10 (the worst); they show the weight which corresponds to a given height at all ages and the position amongst public school boys of the same age which a boy of a given height and weight occupies. With this chart it is possible to see at a glance the position that any boy occupies amongst his fellows on entry and what is more vitally important, if he is going up or going down from his own original grade. By comparison with his grades, the average boy on entry at the age of thirteen and a half years amongst the last 2,500 is somewhat heavier and taller than his predecessor of forty years ago. During the war privation period he stood still, but during the three years, 1925, 1926 and 1927, he has made a definite advance. The average annual gain in weight is very constant, for example, 6·5 kilograms (14·2 pounds) between 13 and 14; 6·0 kilograms (13·4 pounds) between 14 and 15; 4·6 kilograms (10·25 pounds) between 15 and 16 and only 2·5 kilograms (5·5 pounds) after that age. Actual loss of weight during the term is not uncommon and experience shows that by far the majority of losses occurs amongst boys after puberty and, generally speaking, this is a matter of small importance. No boy before puberty, however, should lose weight. The author has recently attempted to classify all boys on entry into categories A, B and C: A, the very good, sound, active boy with no defect; B, the boy "nothing much wrong, might be better"; C, the poorly nourished boy with some physical defect or defects which need special care and attention. The number in group C is surprising. The main disabilities of this class C are flat feet, flattened or scaphoid type of chest, badly shaped spines, poorly developed, toneless muscles, faulty development of the naso-pharynx. These together with defective vision, poor circulation and a general lack of skin tone make a melancholy composite picture, seen all too often. After discussing the school illnesses met with, the author concludes that the public school boy is probably on the average somewhat heavier and taller than his predecessor, but definitely less robust and more delicate. The lowering of the average is due to the fact that more weaklings come to school now than formerly, by reason of the improvement in school hygiene. The net result is that there is more sickness and that the catarrhal group is by far the most important and most numerous of school maladies with the constipation group second, both of these groups having their origin before the boys reach the school.

Milk Supply.

R. STENHOUSE WILLIAMS (*The Journal of State Medicine*, February, 1928) details the steps that are being taken in England to improve the condition of the milk supply. Under the scheme of county clean milk competitions carried out by the Ministry of Agriculture during 1927 at least one thousand farms scattered all over England and Wales were engaged in competition one against another to see which of them could produce the cleanest milk. The Ministry has also set up advisory bacteriological posts at provincial centres throughout the country. At these posts samples of milk on behalf of the farmer and dairyman are tested, investigations are carried out and as much help and advice as possible are given. The Ministry has also appointed instructors in the counties to visit farms and to advise and assist those who are anxious to improve their supply. Classes for the study of milk are held at the Chelsea Polytechnic. These classes are a great success; in 1927 there were sixty-five students on the register, the majority of whom were smaller dairymen in and around London and roundsmen and foremen from the larger distributing depôts. The system of the Ministry of Health in granting licences to those who wish to produce a better quality of milk, has proved a great stimulus to progress. The Ministry of Health also encourages its sanitary inspectors to attend classes on the handling of milk which are held at agricultural colleges. Those in contact with the milk trade find that two things are taking place; on the one hand, there is an increasing desire to make use of scientific knowledge and, on the other, there is the recognition that better work is worth more money. Figures are quoted from the annual reports of the Medical Officers of Health for Glasgow, Leicestershire and Leeds. Those for Glasgow show that 60% of the milk coming from the farmers had a bacteriological count of less than 200,000, and that 16% had a count of over 1,000,000. In Leicestershire the proportion below 200,000 was 51% and those above 1,000,000 amounted to 15% of the total. In Leeds it is found that 90% of the samples were below 200,000 and only 6% were over 500,000. From figures obtained from the study of milk of twenty-four farms coming from the Midlands to London during the period April to August, 1927, 83% of the total were below 500,000 and not more than 10% gave counts over a million. The work of the Midland Counties Dairy, Birmingham, has been going on for four years. In 1922 only two farmers were able to send milk of which the average bacteriological count was less than 10,000; in 1926 that number had risen to sixty-nine. In 1922 fifty farmers were sending in milk with a count of less than 200,000; in 1926 there were one hundred and thirty-three such farmers. Similar results are demonstrated by a study of the figures of licensed milk producers. It is found, however, that it is more difficult ot eliminate coliform organisms than to reduce the count. The Ministry of Health has put into effect the Tuberculosis Order, which will reduce the number of sources of tuberculous infection in the herds and at the same time the number of herds being tested will constantly increase. The fact that no other country in the world can show so long a list of large cities free from a single death from enteric fever is of immense importance to the milk industry and to a large extent helps to improve the ever-present fear of infectious disease which has had so great an influence on the minds of the members of the industry and on milk legislation. There is no doubt that improvement is taking place in the cleanliness of ordinary milk and in that of milk produced under licence.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on April 13, 1928, DR. J. NEWMAN MORRIS, the President, in the chair.

Hyperplasia of the Breast.

MR. A. J. TRINCA read a paper entitled: "Abnormal Hyperplasia of the Female Breast and its Relation to Tumour Formation" (see page 732).

MR. FAY MACLURE expressed appreciation of Mr. Trinca's paper which had thrown a great deal of light on the problems connected with enlargement of the breast. The first series of slides dealing with the evolution and involution of normal breast tissue showed a relationship with similar changes occurring in the thyreoid gland. The same relationship appeared when malignant changes were considered. Mr. Maclure said that he had given much thought to the causes of cancer of the breast and particularly to some long continued causes such as the constantly recurring stimuli of evolution and involution and the failure of the latter to reach completion.

He suggested that the biochemist might provide a product in the future to promote complete involution and so diminish the incidence of malignant and other abnormal changes. Referring to Mr. Trinca's practical suggestions, Mr. Maclure considered that the demonstration of the true nature of so-called "chronic mastitis" was helpful to the clear understanding of conditions previously obscure. He considered that the wide excision of adenomata and other tumours was very important and particularly condemned the practice of cutting into suspicious tumours. He laid stress on the importance of age in the diagnosis of tumours and he taught in his own clinic that any tumour in the breast of a woman over forty should be considered malignant until proved otherwise. In too many cases the operation for diagnosis and removal was done in two stages and in the meantime much damage was done. It was necessary that the two stages should be done at one sitting and that the pathologist should be in attendance in the theatre.

DR. ROY HUCKELL said that he had listened with great attention to Mr. Trinca's paper, as the subject of so-called "chronic mastitis" had always interested him very greatly. Cheatle's work had been illuminating and now Mr. Trinca's investigations had thrown more light on the subject. But even recently Rowntree, of the London Cancer Hospital, in a paper read at Glasgow, in discussing diagnosis, had laid stress on the early signs of skin adhesion which should be understood to indicate a comparatively advanced state of malignant change.

Dr. Huckell gave some details of three patients of his own in recent years. They were all unmarried, non-parous women from thirty to thirty-three years of age. They had all had bilateral nodularity in the breasts and none of the textbook signs of cancer had been present. One had had two or three tiny axillary glands on one side, but even this has not always been regarded as indicating malignant disease. One patient had been examined eighteen months previously by a well known practitioner and had been assured that "there was nothing to worry about." Yet the pathologist in all of them had found at some point undoubted spheroidal celled carcinoma and it was impossible to say when this change from an apparently benign condition to a malignant one had taken place. Mr. Trinca himself had reported on one case. A piece of breast tissue had been sent to him which had been cut in two to make it fit into the container. The report on the one piece was "spheroidal carcinoma" and of the other, "acinar hyperplasia," yet it might be that the thickness of a knife cut separated the two. Mr. Trinca had mostly spoken of this change occurring during the involution changes following lactation. But Dr. Huckell wished to emphasize that none of these three women had lactated and they had all been two years younger than the usual "cancer age." True, Mr. Trinca had mentioned the physiological temporary changes that occurred in the breast at the menstrual epoch and had suggested endocrine influences, but Dr. Huckell asked himself if post-lactational involutionary changes were really so all important. If so, it was hard to explain why cancer of the breast had been shown by statistics to be almost as common on a *pro rata* basis in non-parous as in parous women. It was perhaps a coincidence, but the three patients whom he mentioned, had all presented symptoms of intestinal stasis and visceroptosis and he thought again of Hare's theories. But the practical point of this paper turned on the treatment. What was the surgeon to do? It had to be admitted that the diagnosis should be made by the microscope, if operative statistics were going to be improved. On being consulted by a woman with a nodularity of one or even both breasts (for bilateral character could no longer be regarded as an *a priori* sign of innocence) there were several things which could be done: (i) General medical treatment with periodical reexamination for any sign of the usually described malignant characters, this idea was surely impossible; (ii) exploratory incision and an immediate macroscopical diagnosis following Bloodgood's dictum; (iii) cutting out of a wide piece and an immediate diagnosis by frozen sections done by a pathologist on the spot, he had always felt more than dubious of this method, but apparently Mr. Trinca felt confident of it; (iv) cutting out of a wide piece and submitting it for serial paraffin sections with an operation a few days later if necessary. The Johns Hopkins Hospital people held that these patients were all dead within three years and Ochsner supported their statement, unless the operation was done as a very wide excision with the electric cautery. Lastly, there was the method which Dr. Huckell himself had followed lately. He did a complete resection of the "rotundity" of the breast and if paraffin serial section revealed any spot of carcinomatous change, he proceeded as soon as possible to a radical operation. Dr. Huckell confessed he was perplexed. On the one hand there was the odium of being thought to do unnecessary operations and on the other hand the danger of either activating malignancy or allowing time for skeletal metastases. He asked for light.

MR. R. C. BROWN expressed interest in the paper which illustrated the advantage of combining the rôles of pathologist and practical surgeon. He considered that the paper was a valuable contribution, representing a great deal of disinterested hard work. Mr. Brown said that in his experience immediate microscopical examination of tumours had been of great advantage. On several occasions he had removed small breast tumours which showed active malignant change, leading to an immediate radical operation. He also agreed that it was dangerous to cut into tumours for examination purposes. He had seen two cases in which this procedure had been followed by death within six weeks with general dissemination. Mr. Brown expressed doubt as to the best routine treatment for so-called "chronic mastitis." He thought that mammectomy in every case would lead to too many operations being done.

DR. JOHN FIDDES said that, having worked with Mr. Trinca, he was in complete agreement with Mr. Trinca's conclusions. He was at variance with him, however, in regard to the pathologist accepting full responsibility for the extent and nature of the operation. This should be a joint responsibility. As Mr. Trinca had a dual personality, that of surgeon and that of pathologist, he was in the position of having one part blaming or justifying the action of the other. Dr. Fiddes joined with other speakers in expressing gratitude for an interesting lecture.

DR. W. J. PENFOLD approved of the view that the problem of the causation of breast neoplasms was largely a biochemical one. In a certain aniline factory employing thirty workers, twenty-nine had suffered from tumours of the bladder in ten years.

Among possible factors to be considered were retention cysts and endocrine action and these could be investigated in laboratory animals.

DR. J. NEWMAN MORRIS, the President, also expressed his appreciation of the paper which was, he thought, one of the most important ever presented to the Branch. He was glad they had been spared another classification based on a few facts and a vast amount of speculation. Mr. Trinca had brought forward new facts and advanced

the knowledge of the pathology and his paper would focus attention on the difficulties and dangers of the diagnosis of breast neoplasms. In no type of lesion perhaps had more mistakes been made than in the one under discussion. Broders and Macarthy, of the Mayo Clinic, had stated that 5% of pathological errors and 22% of clinical errors occurred in diagnosis. It had been said that pathologists in Melbourne had a higher reputation for infallibility than in any other city, the tendency being to trust implicitly to the pathologist's report. Referring to the treatment and pathology of chronic mastitis, Dr. Morris agreed that the condition was probably not inflammatory and should not be treated by rubbing in liniments *et cetera*. He had never seen leucocytes or organisms in smears of the secretions of breasts, the subject of so-called "chronic mastitis."

He had recently seen a patient, a woman of thirty, with a tumour of the right breast, with no enlargement of the lymphatic glands. He had removed the tumour and the pathological report was "intracanalicular fibro-adenoma." The patient had returned three months later with three swellings in the same breast. He had done a radical amputation and the report on two of the swellings was "fibro-adenoma with myxomatous changes" and on the third "fibro-myxo-sarcoma."

Dr. Morris concluded by expressing gratitude for an excellent paper, excellently prepared and delivered and for the able assistance of Dr. George Foreman in preparing and demonstrating the slides.

Mr. Trinca in reply thanked Dr. George Foreman for his efficient collaboration in the demonstration of lantern slides. The subject was a difficult one, especially the debatable problem of treatment, one of the most difficult in surgery, ranking with that of duodenal ulcer. Further research was required to determine which macroscopical and microscopical appearances were likely to lead to cancer. The finding of definite metaplasia in the epithelium of ducts should lead to removal of the breast. Dr. Huckell had commented on the frequency of breast cancer in nulliparous women. It should be remembered that breast evolution and involution occurred in childless women from other causes than pregnancy, causes such as puberty, menstruation *et cetera*.

Cancer of the breast and mastitis were said to be comparatively rare in Japan and he suggested that the abnormal sex life led by many civilized women in Western nations with their evasion of motherhood might lead to the stimulation of breast tissue without the full evolution and involution of pregnancy.

In reply to Dr. Fiddes, Mr. Trinca considered that the responsibility of the pathologist was a big one, but that he should accept it fully and should advise the surgeon specifically as to what operative procedure should be adopted and personally he was prepared to do this.

Finally, he considered that Dr. Penfold's suggestion of a biochemical line of attack was a good one and should be followed up.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on April 27, 1928, DR. J. NEWMAN MORRIS, the President, in the chair.

Conservation of Function in Gynæcology.

DR. VICTOR BONNEY read a paper entitled: "The Conservation of Function in Gynæcology" (see page 741).

In opening the discussion DR. A. N. MCARTHUR said that one must realize that Mr. Bonney's teachings were in accord with the views of most gynæcological surgeons of considerable experience. Mr. Bonney had not mentioned the conservation of the pregnant uterus in the presence of fibroids. One such patient had consulted Dr. McArthur, pregnant and with a series of uterine fibroids, one of which was low down in the pelvis. This, of course, was the dangerous one. The dangers of the position were explained to the patient, who chose to have the tumours removed. At operation the lowest fibroid presented the most difficulty. It was so deeply imbedded in the uterine wall that on removal the membranes were exposed. One of the upper tumours was pedunculated and could be used as a tractor and the operation was successfully completed. The patient came to term and her child had become a grown woman. As regards ovarian pain, Dr. McArthur agreed that it was often difficult to determine the cause, but was of the opinion that the ovary which was not the seat of obvious disease, could cause pain. One such patient had come to him, a white worker earning her own living, who was emaciated and almost suicidal from suffering. The trouble had commenced five days before her periods and she had had to lie up with agonizing bilateral pain. Dr. McArthur had operated and removed both ovaries and replaced half of each as a graft on the round ligaments. Three months later she had commenced to menstruate again and had had no more pain. Later she had developed pulmonary tuberculosis, but had recovered and had married; she had two children. Was that ovarian pain or not?

With regard to tube conservation, Dr. McArthur had performed colpotomy to drain both tubes on one patient with acute salpingitis. The patient had not returned for further treatment, but had given birth to a child two years later. Dr. McArthur agreed that one should never be hopeless about conserving the ovary in cystic disease. He had seen a large right ovarian cyst in a patient whose left ovary had been removed previously. He had enucleated the cyst and had left the remaining fragment of the ovary *in situ*. Eighteen months afterwards this woman had been delivered of a healthy child. His experience of salpingostomy in diseased tubes had been disappointing. No pregnancy occurred and the tubes were found later to be again occluded. One such patient had had two successive ectopic gestations and this was the nearest approach to a good result that he had seen.

Early removal of the ovaries always led to atrophy of the uterus. It was encouraging to hear that the actively inflamed tube could be dealt with in its acute stage. He had never had the temerity to do so, but Mr. Bonney's encouragement had tempted him to do so.

Dr. McArthur expressed his appreciation of Mr. Bonney's masterly and enlightening address.

DR. W. G. CUSCADEN said he had first seen Mr. Bonney perform myomectomy in 1924, sewing the uterus to the anterior abdominal wall. At the time he had thought that the procedure was inconsistent, but when Mr. Bonney asked what trouble he had seen after such fixation, he was forced to admit that he had never seen any great trouble. Concerning the question of acute salpingitis, the bad results achieved by the older methods, fæcal fistulæ *et cetera*, had driven Mr. Bonney to adopt more active methods, but had forced him (Dr. Cuscaden) to the other extreme, conservatism.

DR. B. MILNE SUTHERLAND expressed great interest in Mr. Bonney's paper which had given them very much to think about. It had followed and supported a paper on surgery read before the Medical Congress in Canada three years ago by a past President of the British Medical Association. The reader had maintained that the tendency was to remove as much structure as possible and not to be conservative. On the other hand Mr. Bonney, after many years' experience, tended towards conservatism, except in acute salpingitis. In Vienna, Britain and America the treatment of the latter condition was undoubtedly conservative. He had seen one surgeon close the abdomen in a case of double acute salpingitis after having removed a normal appendix. Dr. Sutherland said that he personally had an open mind on the matter and would hardly go as far as Mr. Bonney, but would suit the treatment to the condition of the patient. He had known three women who had had double acute gonorrhœal salpingitis, and had subsequently had children. He thought it was essential in such cases to give the woman a chance of having a child, if possible. He was not certain that he had had success with plastic operations on inflamed tubes, but one patient of his at the time of the meeting seemed to be pregnant. Concerning the ovaries much depended on the manner in which they were ligatured during the operation of salpingectomy. The patient might return later complaining of pain and cystic ovaries which could be cured only by removing the ovary. Dr. Sutherland

said that in future he would leave as much ovarian tissue as possible. With regard to multiple fibroids he held that in some cases it was almost impossible to remove every small fibroid; he usually performed supravaginal hysterectomy which he thought was the best treatment under ordinary conditions, reserving the conservative treatment for where specially indicated. He paid a tribute to Mr. Victor Bonney's generosity in operating in the various Melbourne hospitals for their instruction.

DR. PERCY G. BRETT asked how Mr. Bonney dealt with the submucous fibroid, particularly the large sessile type causing menorrhagia.

DR. RAY ALLAN asked what method Mr. Bonney adopted with the hypertrophied uterus with chronic leucorrhœa.

DR. E. E. MACKAY asked Mr. Bonney to discuss the commonest causes of left-sided pelvic pain and the treatment he adopted.

DR. A. R. HAYWOOD asked what sort of cat-gut Mr. Bonney used in sewing up cavities in the uterine wall.

DR. J. NEWMAN MORRIS said that Mr. Bonney had not left any doubt as to what he meant by conservation in gynæcology and he had made it very clear that it was necessary to bear this principle constantly in mind.

Mr. Bonney, in replying, spoke of Dr. McArthur's reference to myomectomy in pregnancy. He considered it an important point in conservation. He had removed as many as nine large fibroids from a pregnant uterus with success. He had not attempted more than this owing to the obvious risks. In worse cases he treated the pregnancy as another fibroid and enucleated this also. In some patients subsequent pregnancy had occurred. There was not as much bleeding in this operation as might be expected, as the uterine muscle was contractile.

Referring to Dr. McArthur's unusual case of ovarian grafting, Mr. Bonney expressed great interest, but doubted whether the pain had been ovarian as the ovarian function had continued, though the pain had ceased. He thought that the pain had more probably been in the attachments of the ovary. He did not deny that complete recoveries did occur after acute gonorrhœal salpingitis, but he had had no luck with his patients; the condition had resulted in much thickening and knotting of the tubes.

In severe salpingitis he could not conceive of such a tube renovating itself and he always removed such tubes to avoid infection of the ovary. He considered a waiting policy dangerous as an appendicitis or diverticulitis or an extrauterine gestation might be incubating, all of which were difficult to distinguish from salpingitis. An acutely inflamed appendix was operated on as a matter of course, why, Mr. Bonney asked, should a difference be made in acute salpingitis, when the operation was just as safe and promised cure in four weeks? Mr. Bonney said that he had been brought up in a conservative school. There were always several good-looking girls lying in the wards of the Middlesex Hospital suffering from the effects of the conservative treatment of acute salpingitis which went on for weeks or months; they did not return to health even then. He insisted on the same rule in salpingitis as in appendicitis and also emphasized the fact that ventrofixation of the uterus when properly done, did not interfere with pregnancy or labour. With regard to salpingectomy he was in the minority, but he did not think much of the majority, many of whom had never done it.

Referring to Dr. Sutherland's remarks, Mr. Bonney said that he was struck with the rarity with which the ovaries give trouble after hysterectomy. He thought that even very small fibroids could be felt and removed. He did not believe that fibroids were formed in successive crops, as he had never had to operate a second time for their removal.

Replying to Dr. Brett, he considered the submucous fibroid the easiest of all; the operation was the same as for Cæsarean section. The cavity of the uterus was opened also in a large proportion of his myomectomy patients. For sutures in the uterus he used cat-gut or cat-gut with strands of silk interwoven with it. He did not use many mattress sutures as they were liable to cause exsanguination and necrosis of the sutured edges and he had lost one patient from this cause. Although the line of finished sutures was liable to be pale from diminished blood supply, it should not be dead white. In chronic salpingitis with a diseased uterus and leucorrhœal discharge he removed the uterus and the tubes. Regarding the cause of left-sided pelvic pain, he thought that this was at times due to dragging on the colon or the ovarian pelvic ligaments; he had opened the abdomen for such conditions, but had found nothing abnormal in the majority of patients. This complaint was common in the ill-nourished woman, thin, miserable and often visceroptotic. It was evidently a diseased condition, but he did not know the cause.

In proposing a vote of thanks to the lecturer Dr. J. W. Dunbar Hooper said that Mr. Victor Bonney had to be thanked for a delightful evening, one that had rejoiced their hearts and had fittingly rounded off his visit to Melbourne during which they had learned to appreciate his mastery of surgery, his sympathy with his patients and his wonderful operative technique.

The motion was seconded by Dr. E. A. Spowers and carried with acclamation.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Power, Thomas Felix Washington, M.B., Ch.M., 1926 (Univ. Sydney), Western Suburbs Hospital, Croydon.

Redshaw, George Muir, M.B., B.S., 1927 (Univ. Sydney), Beecroft Road, Cheltenham.

Correspondence.

THE VENEREAL DISEASES PROBLEM.

SIR: In reply to a writer who criticizes the annual report of the Australian Association for Fighting Venereal Diseases, may I say that it is quite true that during the war statistics of the venereal diseases infections were not published although they were only too well known to the staff, especially in Egypt. Since the war they have been published annually and have been referred to specifically in our reports for 1924 and 1925. I did not repeat these quotations recently as I thought people were familiar with them.

In the British Army the ratio of 74 venereal diseases cases per 1,000 in 1921 fell to 47·28 in 1924. In *Health and Empire*, December, 1927, a report appears showing the steady decline of venereal diseases in the United States Army from 1909. There was a temporary increase during the war. The rate in 1909 was 179 and in 1925 fell to 59. Compulsory prophylaxis was in force. In Mr. Wansy Bayly's work on venereal disease (Third Edition, 1927) the following tables are given.

BRITISH ARMY AT HOME.

	Gonorrhœa.	Soft Chancre.	Syphilis.
1921	26·7	3·8	9·8
1924	19·9	1·4	3·9

IN INDIA.

	Gonorrhœa.	Soft Chancre.	Syphilis.
1921	67·7	21·7	21
1924	47·1	12·1	9·7

In the Army of the Rhine the venereal disease rate fell from 136·3 in 1923 to 38·4 in 1924.

The measures adopted were (i) moral and medical education, (ii) recreational and medical prophylaxis, (iii) notification, (iv) treatment.

These tables were published by the British Director-General of the Army Medical Service.

The report of the British Social Hygiene Council shows that from 1920 to 1926 civil cases reported in Great Britain show a reduction from 118,000 to 95,000, but from 1925 to 1926 there has been a rise from 91,000 to 95,000.

In Australia it is difficult to think that there has been any serious reduction. The grosser manifestations of syphilis are less common, probably because of more efficient treatment. In any event, whether in Australia or Great Britain, the decline in civil life, if real, is small compared with that effected in the army. The present diffusion of the diseases and the damage done cause them to transcend in importance cancer or tuberculosis. The problem is unpleasant and consequently these diseases are difficult to control.

As regards prevention I suppose no one really thinks that fear will extirpate or even seriously diminish venereal disease. Knowledge will not by itself effect the desired result, but improvement will not be effected without knowledge. The association does not recommend sex education *per se*, but it does emphatically assert that all adolescents should receive an education in biology including reproduction, and that they should receive instruction in the nature of all infections and contagious diseases including venereal diseases. Everyone at some age gets instruction in both problems at present, but usually from his fellows and too often plentifully mixed with obscenity. What is required is a broad and calm statement of the facts given with taste and judgement. Surely such education is as necessary and important as training in Latin or history.

Venereal disease will not be abolished without an altered social outlook and that will not come without knowledge. If limitation of sexual relationship to marriage, early marriage and venereal disease prophylaxis are ruled out as useless, what is left? Is your correspondent really serious in suggesting (if he really does) that compulsory notification and treatment are going to remedy the result of wholesale promiscuity? They may help in amelioration, but are surely of only moderate service as preventive measures. No, the facts are obvious and must be faced. More women are infected at nineteen years of age than in any other year and many before that age. Men at twenty-one and twenty-three—will they be saved from infection by compulsory notification and treatment. May I conclude by quoting the observation made by Huxley in another connexion? "There is no alleviation of the sufferings of mankind, except veracity of thought and action and the resolute facing of the world as it is when the garment of make-believe by which pious hands have covered its uglier features is stripped off." Do let us be quite honest with ourselves and put an end to "the policy of the ostrich."

Yours, etc.,

JAMES W. BARRETT.

June 6, 1928.

[Sir James Barrett as the author of the report of the Victorian Branch of the Australian Association for Fighting Venereal Diseases, has been singularly unfortunate. In the report it is distinctly stated that venereal diseases have diminished greatly in the armies and navies. In his rejoinder Sir James has obtained some information concerning the British Navy and the British Army and the Army on the Rhine. In politics language may be used to persuade people to accept statements without evidence. In science exactness is needed and we maintain that neither Sir James Barrett nor anyone else has information concerning the incidence of venereal diseases in all the navies and armies of the world.

In regard to the second point, we still await some facts, not loose statements, concerning the incidence of venereal disease among members of the civil population.

The third point to which Sir James Barrett takes exception is the value of educational measures in the prevention of venereal disease. It is stated in the last sentence of our article that educational measures should be employed. Our contentfon is that desirable as it may be that young people should be informed accurately concerning sexual physiology, this knowledge will neither reduce promiscuity nor lessen to a material extent the incidence of venereal infections. Sir James Barrett may state that the facts are obvious, but we venture to suggest that from the annual report they have been quite effectually obscured. From the point of view of prophylaxis the methods at the disposal of the hygienist at the present time are an attack on the causative organism of the disease, an increase of the natural or acquired immunity to the disease and a raising of the bodily resistance to the disease. The first can be effected by the detection of every person or animal harbouring the virus and the isolation or segregation of these people or animals and perhaps the destruction of the animal vectors, by the effective disinfection of every person who comes in contact with the virus, by efficient treatment under control of every person infected until no longer infectious and by the application of remedies that will prevent the development of the virus within the living organism. The second group of methods comprises all those biological processes which have been found to render an individual incapable of acquiring infection. The third group is the least reliable and is employed chiefly when other measures are impossible of attainment. No one would attempt to prevent enteric fever or leprosy by instructing children about the physiology of digestion or of the function of the skin. The well meaning societies of old ladies who fondly imagine that they can reform the world by telling the young that it is wrong to indulge in illicit intercourse, do not face facts. They are blind to the experience of centuries of failure. The associations of publicists and propagandists who pin their faith in such uncertain weapons as education in sex physiology, do not face facts. They ignore the essential fact that preaching and teaching have little prophylactic value and that the reduction that has been effected in the incidence of venereal diseases, has been based on discipline and compulsion. Information concerning the source of infection and attacks on this source are the main measures of prevention on which reliance can be placed.—EDITOR.]

Post-Graduate Work.

POST-GRADUATE WORK IN MELBOURNE.

THE Melbourne Permanent Committee of Post-graduate Work announces that the usual annual refresher course will be held from August 6 to August 17, 1928. The fee for this course is three guineas.

The course of six lectures by Professor F. R. Fraser will be delivered at the Medical Society Hall, East Melbourne, at 8.30 p.m. on the dates given below.

Tuesday, August 7, 1928.—"Causes of Dyspnœa and the Clinical Types."

Wednesday, August 8, 1928.—"Cardiac Dyspnœa."

Friday, August 10, 1928.—"The Therapeutic Uses of Digitalis."

Monday, August 13, 1928.—"Diuresis."

Wednesday, August 15, 1928.—"Heart Failure in Graves's Disease."

Friday, August 17, 1928.—"Hæmatemesis and Its Management."

Members wishing to attend the course should lose no time in sending in their applications to the Joint Honorary Secretaries. The fee for the course is three guineas.

Congresses.

CONFERENCE OF THE INTERNATIONAL UNION AGAINST TUBERCULOSIS.

THE Sixth Conference of the International Union against Tuberculosis will be held at Rome on September 25, 26

and 27, 1928. The conference is organized by the *Federazione Nazionale Italiana Fascista per la Lotta Contro la Tuberculosi*. The subjects to be discussed are of importance. Professor Calmette, of Paris, will open the discussion on filterable elements of the tubercle virus. Professor R. Jemma, of Naples, will deal with the diagnosis of infantile tuberculosis. Dr. E. Morelli will introduce the subject of Carlo Forlanini and the pneumothorax in the treatment of pulmonary tuberculosis. Dr. William Brand, the Medical Commissioner to the National British Association for the Prevention of Tuberculosis, will make a report and open a discussion on the subject of anti-tuberculosis organization in rural districts. Professor Brauer, of Hamburg, will deliver a lecture on the surgical treatment of pulmonary tuberculosis. Honorary members, counsellors and titulary members of the International Union are invited to the conference and receive the proceedings *gratis*. Those who are not members of the Union, may be admitted under the title of "Members of the Conference" on the recommendation of the Government of their country or of the National Association against tuberculosis. Medical practitioners who wish to become members of the conference must therefore make application in the first place to the Government or National Association of their own country. The fee payable in these circumstances is one hundred lire. Members of conference are entitled to receive the official copy of the proceedings.

Obituary.

EGBERT JOHN CONNELL.

WE regret to announce the death of Dr. Egbert John Connell which occurred at Warrnambool, Victoria, on April 4, 1928.

JOHN DANIEL KING SCOTT.

WE announce with regret the death of Dr. John Daniel King Scott which occurred at East Malvern, Victoria, on May 28, 1928.

PERCY SAMUEL WEBSTER.

WE regret to announce the death of Dr. Percy Samuel Webster which occurred at Melbourne on June 8, 1928.

Diary for the Month.

JUNE 18.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 19.—Tasmanian Branch, B.M.A.: Council.
JUNE 19.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 20.—Western Australian Branch, B.M.A.: Branch.
JUNE 20.—Central Northern Medical Association, New South Wales.
JUNE 20.—Western Medical Association (Dubbo), New South Wales.
JUNE 20.—Section of Obstetrics and Gynæcology, New South Wales Branch, B.M.A.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

AUGATHELLA HOSPITAL, QUEENSLAND: Medical Superintendent.

AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Resident Radiologist, Pathologist and Registrar.

ST. VINCENT'S HOSPITAL, SYDNEY: Medical Vacancies.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Boolerob Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington. New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.